RAPID Task Order 2.1 Activity

CONSULTATIVE REPORT ON THE DEVELOPMENT OF A TABLE OF FREQUENCY ALLOCATIONS FOR THE FREQUENCY RANGE 3.1 – 100 GHZ FOR THE SADC REGION

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Summary of the Report

This consultative study report outlines the benefits of a regional table of frequency allocations (band plan) and highlights the key drivers for demand for the radio spectrum in the frequency range 3.1 – 100 GHz. The report focuses on the Fixed Service, particularly the Fixed Wireless Access systems, since these systems have very few frequency bands in which they can operate, yet they have the greatest potential to increase teledensities for basic telephony and provide broadband services in the SADC Region. The report recommends that the SADC Region should:

a. Allocate the 3400 – 3600 MHz band to the Fixed Service for the exclusive by Fixed Wireless Access systems;

b. Allocate the 3600 – 3800 MHz band to the Fixed Service (for Fixed Wireless Access applications and point-to-point fixed links) and coordinated Fixed Satellite Service applications on a shared basis;

c. Allocate the 3800 – 4200 MHz to the Fixed Service (for point-to-point fixed links) and Fixed Satellite Service applications;

d. Assign frequencies in the band 3600 – 3800 MHz to FWA applications only after exhaustion of the band 3400 – 3600 MHz. Similarly, Fixed Satellite Service applications should be assigned frequencies in the band 3600 – 3800 MHz only after exhaustion of the band 3800 – 4200 MHz; and

d. Allocate the 10.5 GHz (10.15 – 10.30)/(10.50 -10.65 GHz) exclusively for Fixed Wireless Access systems.

The draft SADC Regional Table of Frequency Allocations for the frequency band 3.1 – 100 GHz is attached to this report as Annex B. The report proposes a staggered implementation programme for the band plan, subsequent to its adoption by SADC Member States. An immediate implementation of those parts of the plan where there is no migration of existing users required, and full implementation with ten years from adoption.

1. Introduction

In accordance with the objective of harmonising regional policies as laid out in the Southern African Development Community (SADC) Protocol on Transport, Communications and Meteorology, the Southern African Transport and Communications Commission Technical Unit (SATCC-TU) of SADC initiated a process to develop a regional band plan for the frequency range 20 to 3100 MHz in 1997. Subsequent to the formation of the Telecommunications Regulators' Association of Southern Africa (TRASA) in 1998, SATCC-TU handed over the development of the regional frequency plan to TRASA. The plan was completed in May 2000.

This study was aimed at extending the regional band plan from 3.1 GHz to 100 GHz. The study reviewed developments with regard to the usage of radio frequencies above 3.1 GHz regionally and internationally. The results of the research were used to produce the proposed regional table of frequency allocations which is attached as Annex B of this report.

This report has taken into account comments on the draft preliminary report made by TRASA Technical Committee Members and SATCC-TU who attended the initial meeting held in Windhoek, Namibia on 4 – 5 April 2002, comments received from stakeholders and submissions made by stakeholders at the stakeholders meeting held in Windhoek, Namibia on 26 June 2002, and conclusions reached by the TRASA Technical Committee on 27 June 2002 in Windhoek. The terms of reference for this assignment are in Annex A of this report.

2. What are the Benefits of a Regional Table of Frequency Allocations?

The success of SADC's regional economic integration will depend on, *inter alia,* the availability of reliable transport and communication systems to facilitate the movement of goods and services in the region. Transport systems vary in complexity, from simple systems that control road traffic signs to complex systems that use satellite systems to track the movement of vehicles transporting valuable goods, microwave landing systems that are used for guiding aircraft during landing and take off, radar systems that assist in air traffic management, radar systems for assisting in weather predictions, etc. Efficient communications systems will enable the businesses community in the region to find markets both internally and externally for their goods and services (for example by advertising and searching for markets on the internet). All these systems rely on radio communications systems. A harmonised regional table of frequency allocations will ensure that radiocommunication systems that provide services at regional level will be allocated sufficient spectrum to meet their requirements.

Most countries in the region have very small markets to attract large investments in the information and communications technology (ICT) sector on their own. As a result, potential investors in the ICT sector would be more inclined to invest in any one country if such investment can be easily extended to the whole region or if their products and services will have access to the whole regional market. A common regional radio frequency plan will facilitate the attainment of economies of scale for

such products because, if the region adopts the same plan, the same type of radiocommunications equipment can be supplied to the region in large volumes and that would lead to a lower unit cost to operators. This would in turn, will lead to lower prices for services provided to consumers, thereby stimulating other economic activities and improving the overall economic welfare of the region.

As the liberalisation in the telecommunications sector develops in the region, some operators will want to provide services across borders. In some cases this might mean using the same radiocommunications equipment in a number of countries (e.g. installing cross-border radio systems, vehicle tracking systems, etc). While this is an issue that is more relevant to the manner in which telecommunications systems are licensed across the region, a common band plan will facilitate such licensing and ensure that regional and international operators have access to the whole SADC market, when the market is fully opened for competition. At a technical level, a common allocation table will simplify frequency coordination procedures along border areas.

Therefore, just like other initiatives undertaken in SADC, such as the development of the Interconnection Guidelines and Guidelines on Tariffs for Telecommunications Services, the regional band plan is intended to facilitate the economic integration of the region. By allocating the radio spectrum in an agreed manner across the whole region, SADC will ensure that this scarce resource is used to support the development of reliable transport and communications infrastructure in the region. Such infrastructure is a prerequisite for socio-economic development.

3. Best Practices from other Jurisdictions

As required by the terms of reference for the assignment, the study reviewed numerous publications that deal with the use of the radio frequency spectrum and regional band plans. The major references used during the research for the study were:

i. The ITU – R Radio Regulations of 2001;
ii. The Final Acts World Radiocommunications Conference (Istanbul, 2000);
iii. European Radiocommunications Committee (ERC) Report 25, 2002;
iv. The SADC Regional Band Plan (20 – 3100 MHz);
v. The SADC Protocol on Transport, Communications and Meteorology; and
vi. Other international publications on the development of tables of frequency allocations and the use of the radio spectrum.

The International Telecommunications Union (ITU) is a specialised agency of the United Nations responsible for international regulation of the use of the radio frequency spectrum. The ITU has promulgated the Radio Regulations which set out the rules for the use of the spectrum on a worldwide basis. The ITU hosts World Radiocommunications Conferences (WRCs) every two to three years to revise the Radio Regulations, the international treaty obligations governing the global use of the radio spectrum and satellite orbits. The latest conference was held in Istanbul,

Turkey from 8 May to 2 June 2000 and the latest version of the Radio Regulations were published in 2001.

In addition to information from the ITU, the study also looked at regional band plans in other jurisdictions. Since Africa and Europe are in the ITU Region 1, it was felt that it would be beneficial to study the European Common Allocation (ECA) Table which was produced by the European Radiocommunications Committee (ERC) of the European Conference of Postal and Telecommunications Administration (CEPT) in 1994. It was subsequently reviewed in 1995, 1998 and the latest version which was released in January 2002. An important consideration in reviewing the ECA was the fact that since the ECA is a regional plan (as opposed to a national plan), it might have some useful features that the SADC Region may find worth considering. For example, the ECA includes regional footnotes, however, it makes no reference to national exceptions (that is national footnotes). This is important because it means that the countries in the European region agreed on a regional plan, and developed regional footnotes to support that vision. National administrations are then required to structure their national plans to conform to the regional plan in some agreed time frame (in this case by 2008). The inclusion of national footnotes in a regional plan would defeat the objective of a common vision in the use of the radio spectrum and all the benefits that come with such usage.

The ECA Table has been adopted by all forty four (44) CEPT administrations. These administrations are Albania, Andorra, Austria, Azerbaijan, Belgium, Bulgaria, Bosnia and Herzegovina, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Former Yugoslav Republic of Macedonia, Moldova, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, San Marino, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom and Vatican City. CEPT administrations are currently migrating their national spectrum allocations to comply with the ECA Table and all CEPT administrations are required to comply with the ECA Table by 2008.

4. Format of the Proposed SADC Table of Frequency Allocations

Annex B shows the format of the proposed Table of Frequency Allocations for the SADC Region. The first column shows the frequency range, in MHz or GHz. The second and third columns show the services that have been allocated the frequency band in question, for Region 1 and Region 2, respectively, by the ITU. The services shown in capital letters indicate primary (priority) allocations while those in small letters indicate secondary allocations. The fourth column shows the main utilisations or applications (not allocations) that mainly use the frequency band in question in the CEPT Region. The ECA allocations were not included on account of shortage of space, that is, the table would become too crowed and difficult to read.

Column five, ‘Proposed SADC Common Allocation’, shows the proposed common allocation for the SADC Region. Column six, ‘Recommended Main Utilisation in SADC’, shows the proposed main applications that will use most of the radio spectrum in the band in the SADC Region. Applications shown under this column are

not meant to be those given priority or exclusivity, unless stated as such, e.g. 3500 MHz and 10.5 GHz bands. In some cases the future usage of the spectrum in a particular band is uncertain in which case the column has been left blank. Column seven, 'Remarks', includes comments about allocations in Region 3, where such allocations differ either with those in Region 1, Region 2 or both. If the allocation in Region 3 is the same as that in both Region1 and Region2, no comment is made about the allocation in Region 3 in the Remarks column. If the allocation in Region 3 differs from both allocations in Regions 1 and 2, the allocation in Region 3 is shown in full. Allocations for Region 3 were shown in the Remarks column to avoid including another column for Region 3 allocations which would crowd the table with too much information and thus making it difficult to read. In addition, the Remarks column also includes general comments about spectrum usage as appropriate.

Annex 1 shows the proposed channel plans for the various frequency bands and proposed regional footnotes. The TRASA Technical Committee (the Committee) decided at the meeting held on 27 June 2002 in Windhoek that details regarding the use of various frequency bands (e.g. equipment standards, whether a frequency band is used for narrow band or broadband Fixed Wireless Access, etc) should be left to individual countries. The Committee also decided that each SADC Member State would review its current radio spectrum usage in the frequency band 3.1 – 100 GHz and develop its own migration strategy. Normally these issues form the basis for detailed footnotes. In view of these decisions, few Regional footnotes have been developed. The CEPT and ITU footnotes are shown in Annex 2 and Annex 3, respectively, of the draft plan. The ITU Regions 2 and 3 allocations and associated footnotes, CEPT Main Utilisations and associated footnotes will be deleted at the end of the consultation process.

5. Causes of growth in demand for the radio spectrum

For radio frequencies below 3 GHz, the driving force in the demand for these frequencies is the huge growth in mobile services. As a result, at the 1992 World Administrative Radio Conference (WARC 92), the ITU adopted a recommendation that frequencies below 3 GHz should be used mainly for mobile services. Other services (e.g. the Fixed Service) that were previously in this frequency range would be allocated frequencies mainly above 3 GHz.

Frequencies above 3 GHz have traditionally been used mainly for fixed point-to-point medium to high capacity links. The liberalisation of the telecommunication market in many countries has led to a large growth in (telecommunications) traffic volumes due to an increase in the number of customers. This has, in turn, led to a proportionate growth in the demand for high capacity telecommunications transmission systems. In developed countries, this demand has been met in part through the installation of fibre optic systems. The rollout of fibre optic systems is slow and costly, hence for developing countries, radio remains the transmission system of choice for medium and high capacity transmission systems because radio links are cheaper and faster to install than fibre optic systems. In addition, since external features (protective coating) of fibre optic cables look the same as those for copper cables, in developing countries, fibre optic cables are often prone to vandalism by thieves looking for

copper cables. However, fibre optic systems are also used in developing countries on high traffic routes between major centres and in urban areas to link local exchanges.

Base stations for mobile telecommunications systems have to be connected to mobile switching centres. In general, radio provides an optimal means for such connections since it is quicker and cheaper to install than fibre optic cables. The phenomenal growth in the number of mobile customers has led to a proportionate growth in the number of base stations required to maintain a reasonable quality of service for mobile services. This in turn means that the demand for the radio spectrum required for backhaul links between mobile base stations and their switching centres has also grown proportionately.

The net result of all the above is that the demand for the radio spectrum has increased considerably. It should be noted that the above discussion focused only on the Fixed Service. However, there are many other applications (e.g. Fixed Satellite Service, Broadcasting Systems, military systems, etc.) that are also experiencing growth in demand, and in some cases these systems compete for the use of the same frequency bands with the Fixed Services.

6. Advantages of Fixed Wireless Access Systems over Copper

On the network access (last mile) side, the liberalisation of the telecommunications market in developing countries with low teledensities has also forced incumbent operators and new entrants to look for cheaper and faster ways of providing service than with copper cables. Table 1 below shows the fixed teledensities of SADC Member States in 2000. The 2001 teledensity data for some Member States was not available. That is why the data for 2000 was used instead. While most Members States have increased their teledensities somewhat, the situation remains essentially the same. This table clearly demonstrates that the reliance on copper for the provision of telecommunications services has been ineffective. Therefore the Region needs to consider other available options for providing access to telecommunications services. That is why this report focused mainly on fixed wireless access systems since these applications have the potential to provide operators with a quicker means of providing access to telecommunications services. The emergence of the internet has also led to a demand for more bandwidth than can be provided by most old copper cables.

A fixed wireless access (FWA) radio system is a form of point-to-multipoint (PTMP) radiocommunications system that provides the ‘last mile’ connection to the customer through wireless (radio) instead of copper wire. Some of the advantages of using FWA systems instead of copper to provide the ‘last mile’ connection are:

a. A fast deployment - providing large coverage area in a shorter time than can be done with copper. This leads to a rapid access to the market and thus a shorter time to realise the returns on investment. In countries where there is competition in the network access (local loop) market, FWA

systems provide operators with a means of responding effectively to competition, which in turn leads to better service to consumers.

b. The initial FWA investment is not as heavily frontloaded as is the case with copper, that is, the operator can start with a few base stations which can be quickly increased, both in number and capacity, as the demand increases.

c. FWA systems are less disruptive to urban infrastructure (no need to dig across roads, pavements, etc) and thus local authorities are more tolerant to FWA infrastructure.

d. FWA systems provide a quick means of responding to unplanned developments (e.g. the provision of telecommunications services to new construction sites, major conferences, etc).

f. FWA systems provide a quick and complete re-deployment of unused capacity (unlike copper which in general cannot be redeployed).

Therefore FWA systems provide an efficient and cost effective solution to the provision of basic and broadband telecommunications services.

Table 1: Teledensities of SADC Member States in 2000.

COUNTRY	**TELEDENSITY IN 2000**
Angola	0.8
Botswana	7.1
D.R.C.	0.1
Lesotho	1.0
Malawi	0.4
Mauritius	23.7
Mozambique	0.46
Namibia	6.2
South Africa	11.2
Swaziland	3.6
Tanzania	0.4
Zambia	0.8
Zimbabwe	2.0
Source: BMI Communications	

Note: Data for Seychelles was not available.

Some SADC Member States are in the process of opening their markets to more than one fixed operator to increase competition, which in turn should lead to an increase in the teledensities and greater access to telecommunications services for their citizens. If SADC Member States opened their markets to more fixed operators on the premise that these additional operators will use copper to provide telecommunication services, these additional operators will not make much of a difference with regard to increasing teledensities. In fact, it is very doubtful whether any new fixed operator would be interested in providing service in the access market (as compared to the long distance and international markets) if they were constrained to using copper. Therefore the availability of sufficient spectrum for fixed wireless access systems in SADC Region is fundamental both for ensuring that existing operators can improve their performance and that new operators can also make a difference in terms of improving access to telecommunications service for citizens of the Region.

Most countries in the SADC Region have given their incumbent operators periods of exclusivity during which these operators are required to rollout their services subject to some mandatory rollout targets. In order to meet these targets, the incumbents have sought more spectrum for fixed wireless access systems to take advantage of the faster rollout of fixed wireless access systems. When allocating spectrum to incumbent operators for the purposes of meeting their obligations (prior to the introduction of full competition), regulators should ensure that sufficient spectrum is reserved for the advent of full competition. Regulators should also develop fair and transparent procedures for the allocation of spectrum during full competition. Otherwise, if new entrants do not have access to the fixed wireless access spectrum, there will never be real competition in the network access market, regardless of the number of licensed operators.

7. Highlights and Recommendations of the Study

Comments on Recommended Main Services in SADC

The applications shown under the column entitled 'Recommended Main Utilisation in SADC' are those that would use most of the spectrum in the respective bands. These allocations do not imply a priority or exclusivity status, unless stated otherwise. Other services that are shown under the column entitled 'Proposed SADC Common Allocations' in the band in question would still be allocated spectrum in that band on coordinated basis.

Fixed Service

While the proposed plan shows all services, the focus in this section will be on the Fixed Service (FS) since, for frequencies above 3.1 GHz, the highest growth in the demand for the radio spectrum in developing countries is in the FS. The FS includes point-to-point (PTP) fixed links and point-to-multipoint (PTMP) radio systems. Comments that follow will focus mainly on the proposed allocations for the FS because of the importance of this service to the SADC Region. Short comments on other services are provided in 'Remarks' column in the outline of the proposed plan.

There is a trade-off between coverage distance (range) and the bandwidth (frequency). High frequencies provide high bandwidth but have shorter coverage distances. This trade-off occurs across the whole radio spectrum. The absorption and attenuation of the radio spectrum by rain, water vapour and oxygen imposes severe constraints on the coverage distance of radio systems operating at frequencies above 10 GHz. As a result, high capacity analogue radio systems operated mainly below 10 GHz. The growth in demand and congestion in the radio spectrum for frequencies below 10 GHz forced researchers to find ways of increasing the coverage range for frequencies above 10 GHz. The advent of digital radio systems with better signal processing techniques (adaptive equalizers, forward error correction, etc.) has made it possible for high capacity digital radio systems to operate at higher frequencies with longer ranges than their analogue counterparts. However, the distance-bandwidth trade-off still holds, for example a 10.5 GHz FWA digital radio system can operate with a hop length of about 10 km while a similar system operating at 26 GHz will have a hop length less than 5 km.

On the other hand, the propagation characteristics of frequencies above 20 GHz are ideal for providing short distance communication links. The advantages of operating radio systems in this part of the radio spectrum, include the availability of wide bandwidths and the possibility of multiple frequency re-use over very short distances. In addition, radio systems operating in this frequency range are very compact and lightweight (e.g. small antennas and radio equipment) due to the short wavelengths involved.

Point-to-Point and Point-to-Multipoint Allocations

Table 1 is a summary of the FS allocation proposed in the frequency range 3.1 – 40 GHz. It is intended to show the comparison in the proposed allocations for PTP and PTMP radio systems in this frequency range. From Table 1, it is clear that PTP systems have a large allocation as compared to PTMP. For reasons stated earlier,

the demand for the spectrum for FWA systems will continue to grow more rapidly in developing than in developed countries and it is anticipated that the spectrum for FWA may not be enough to meet the demand in the next 5 – 10 years. In view of the fact that there are very few bands available for FWA applications, it is recommended that SADC Member States should allocate the 3400 – 3600 MHz frequency band to the Fixed Service, for the exclusive use by FWA applications. The band 3600 – 3800 MHz should be allocated to the Fixed Service (point-to-point links and FWA applications) and Fixed Satellite Service on a shared basis. FWA applications should be assigned frequencies in the band 3600 – 3800 MHz only after exhaustion of the band 3400 – 3600 MHz. Similarly Fixed Satellite Service applications should be assigned frequencies in the band 3600 – 3800 MHz only after exhaustion of the band 3800 – 4200 MHz. Considering the difficulty of sharing between FSS and FWA applications (refer to ITU-R Recommendation 1486) and the fact that there are many FSS applications operating in the band 3800 – 4200 MHz, it is recommended that FWA applications should not be assigned frequencies in this band unless it becomes absolutely necessary. However, point-to-point fixed links may be assigned frequencies in the band 3800 – 4200 MHz, on a coordinated basis.

The 3400 – 3800 MHz band is suitable for narrowband (basic telephony systems and data services up to 64 kbit/s) systems and has the longest coverage range for PTMP systems operating above 3 GHz to provide telecommunications services in rural and suburban areas. In fact, the 3400 – 3800 MHz band has become a default FWA frequency band, internationally. For example the ITU has developed a recommendation (ITU-R Recommendation F1488) on block frequency arrangements for FWA systems in this band. CEPT has produced recommendation CEPT/ERC/REC 14-03 on the same band for the same purpose, while CITEL (organisation for North and South American Administrations) has developed recommendation CITEL PCCIII Rec. 26 for FWA systems operating in the frequency band 3400 – 3700 MHz. Some countries in Region 3, e.g. Australia, have adopted the CEPT recommendation for FWA applications.

As can be seen from ITU-R Recommendation 1486, sharing between a single VSAT terminal and FWA applications is very difficult. Sharing becomes unpractical when there are multiple VSAT terminals operating in the vicinity of a FWA system with multiple base stations and terminals. Therefore to avoid interference from the FWA into VSAT terminals, it is recommended that VSAT terminals be migrated to the *ku* band, for example (12.5 – 12.75 GHz)/(14.0 – 14.25 GHz), on an exclusive basis, if necessary.

It is also recommended that the SADC Region should allocate the 10.5 GHz band, (10.15 – 10.30)/(10.50 – 10.65) GHz, to the Fixed Service for exclusive by PTMP applications. This band is suitable for both broadband (2 – 40 Mbit/s per customer) and narrow band systems. The combination of high capacity and reasonably long range (refer to Table 2) makes this band particularly useful for providing backhaul radio systems, operating in a PTMP mode, for mobile communications infrastructure and FWA services. A preliminary review of available data shows that the 10.5 GHz band is currently unused in most SADC countries and hence does not pose many challenges, in comparison with the 3400 – 3800 MHz band.

Table 1: Frequency Bands allocated to the Fixed Service (PTP and PTMP) from 3.4 – 39.5 GHz:

Frequency Bands (GHz)	PTP	PTMP	Comments
3.4 – 3.6	✓	✓	Recommended for exclusive allocation to FWA systems.
3.6 – 3.8	✓	✓	Recommended for shared allocation between FWA, point-to-point fixed links and coordinated FSS systems.
3.8 – 4.2	✓	✓	Recommended for point-to-point links and FSS applications only.
5.925 – 6.425	✓		
6.425 – 6.700	✓		
6.700 – 7.075	✓		
7.075 – 7.125	✓		
7.125 – 7.250	✓		
7.250 – 7.300	✓		
7.450 – 7.550	✓		
7.550 – 7.750	✓		
7.750 – 7.850	✓		
7.850 – 7.900	✓		
7.900 – 8.025	✓		
8.025 – 8.175	✓		
8.175 8.215	✓		
8.215 – 8.400	✓		
8.400 – 8.500	✓		
10.15 – 10.30	✓	✓	Recommended for exclusive allocation for FWA systems.
10.50 – 10.65	✓	✓	Recommended for exclusive allocation for FWA systems.
10.65 – 10.68	✓		
10.7 – 11.7	✓		
12.75 – 13.25	✓		
14.5 – 14.8	✓		
14.8 – 15.35	✓		
17.7 – 18.1	✓		
18.1 – 18.3	✓		
18.3 – 18.4	✓		
18.4 – 18.6	✓		
18.6 – 18.8	✓		
18.8 – 19.3	✓		
19.3 – 19.7	✓		
22.0 – 22.21	✓		
22.21 – 22.5	✓		
22.5 – 22.55	✓		
22.55 – 22.6	✓		
22.6 – 23.0	✓		
23.0 – 23.55	✓		
23.55 – 23.6	✓		
24.5 – 24.65	✓	✓	Shared between PTP and PTMP systems.

24.65 – 24.75	✓	✓	Shared between PTP and PTMP systems.
24.75 – 25.25	✓	✓	Shared between PTP and PTMP systems.
25.25 – 25.5	✓	✓	Shared between PTP and PTMP systems.
25.5 – 26.5	✓	✓	Shared between PTP and PTMP systems.
27.5 – 28.5	✓	✓	Shared between PTP and PTMP systems.
28.5 – 29.1	✓	✓	Shared between PTP and PTMP systems.
29.1 – 29.5	✓	✓	Shared between PTP and PTMP systems.
31.0 – 31.3	✓		
31.5 – 31.8	✓		
31.8 – 32.3	✓	✓	HDFS – Shared between PTP and PTMP systems.
32.3 – 33.0	✓	✓	HDFS – Shared between PTP and PTMP systems.
33.0 – 33.4	✓	✓	HDFS – Shared between PTP and PTMP systems.
37.0 – 39.5	✓	✓	HDFS – Shared between PTP and PTMP systems.

Table 2: Typical Coverage Range for PTP and PTMP Radio Systems:

Frequency Band	Point-to-Point Range	Point-to-Multipoint Range
3.5 GHz	> 45 km	5 – 15 km
10 GHz	> 45 km	5 – 10 km
26 GHz	16 km	2 – 5 km
39 GHz	8 km	1 – 2 km

8. The Implementation Schedule of the Proposed Band Plan

The implementation of a new band plan has to take into account a number of issues such as:

a. The number of current users in the various bands who do not comply with the proposed plan. The migration strategy (procedure to remove non-compliant services from the bands that they currently occupy) adopted to ensure that radiocommucations services comply with the new plan.

b. Facilities available to the regulators to monitor the migration strategy from the current usage to the new plan.

The migration of radicommunications services from bands that they currently occupy to bands proposed in a new plan is invariably very unpopular with the affected users because of the potential cost that such migration might impose on them. Such cost must be weighed against the benefits that would accrue to the region if it adopted the new plan. A detailed analysis of these issues will then determine the most appropriate implementation strategy (i.e. which parts of the plan can be adopted immediately and which parts would need to be implementation after some form of migrations, etc). In general, the implementation strategy will be country-specific, that is the strategy will differ from country to another.

However, considering that SADC Member States have agreed to harmonise their policies for the benefit of the whole region, it seems reasonable to say that there needs to be a cut-off date by which all SADC Members States should comply with

the adopted plan. It is recommended that each SADC Member State should produce an implementation strategy within, say six months of adoption, outlining which parts of the plan will be implemented with immediate effect (i.e. where there are no migration issues to contend with) and a schedule for implementing the remaining parts. It is proposed that where a migration is necessary, such migration should be completed within ten years from the date of adoption of the plan. Each SADC Member State should be required to submit an annual report to the TRASA Secretariat outlining progress in the implementation of the plan. The Secretariat would circulate these reports to other Members States.

9. Conclusions:

SADC Member States are requested to consider this report and the accompanying draft Regional Table of Frequency Allocations, in particular the recommendations that the SADC Region should:

a. Allocate the 3400 – 3600 MHz band exclusively for Fixed Wireless Access systems;

b. Allocate the 3600 – 3800 MHz band to the Fixed Service (for Fixed Wireless Access applications and point-to-point fixed links) and coordinated Fixed Satellite Service applications on a shared basis;

c. Allocate the 3800 – 4200 MHz to the Fixed Service (for point-to-point fixed links) and Fixed Satellite Service applications;

d. Assigned frequencies in the band 3600 – 3800 MHz to FWA applications only after exhaustion of the band 3400 – 3600 MHz. Similarly, Fixed Satellite Service applications should be assigned frequencies in the band 3600 – 3800 MHz only after exhaustion of the band 3800 – 4200 MHz; and

e. Allocate the 10.5 GHz (10.15 – 10.30)/(10.50 -10.65 GHz) exclusively for Fixed Wireless Access systems.

ANNEX A

Terms Of Reference For Spectrum Planning

Introduction:

In 1998, SADC Member States signed the SADC Protocol on Transport, Communications and Meteorology. The Protocol:

i. Was signed in pursuance of Articles 22 and 23 of the SADC Treaty, which provides for Member States to conclude a protocol to expand and deepen their co-operation in areas of infrastructure and services.

ii. Recognizes that transport, communications and meteorology functions are a prerequisite for the promotion of economic growth and development and the improvement of the quality of life and social interaction of all citizens of Member States.

iii. Requires Member States to develop harmonized regional model telecommunications policy and model legislation that are investor-friendly.

The consultant should refer to the SADC Protocol on Transport, Communications and Meteorology for details on the protocol and its objectives.

RAPID Activity TASK ORDER 2.1:
The Telecommunications Regulators Association of Southern Africa (TRASA) approached the Regional Centre for Southern Africa (RCSA) of the United States Agency for International Development (USAID) for support in the development of capacity to implement the objectives of the Protocol. On April 11, 2000, RCSA/USAID awarded a five-year contract to Chemonics International, Inc. to implement the "Regional Activity to Promote Integration Through Dialogue and Policy Implementation" (RAPID). The purpose of RAPID is to provide quick-response short-term technical services related to policy analysis, policy dialogue, and support for implementation of policy changes under RCSA's development assistance program for Southern Africa. RAPID supports RCSA's strategic objectives (SO's) for assisting the further integration of the Southern African Development Community (SADC) member countries in the critical areas of regional market integration (SO 2), increased cooperation in the management of shared natural resources (SO 3), and expanded commercial markets for agricultural technologies and commodities (SO 4).

The Telecommunications Initiative under the RAPID Activity is specifically designed to:

(b) Build the capacity of the region to attract investment and construct modern networks; and
(c) Harmonize policies in the region in order to establish a regional policy framework over telecommunications issues, including issues of spectrum management.

Regional Spectrum Planning and Management Study

The Spectrum Planning Specialist be responsible for the following:

1. Review the current status of spectrum management in the SADC region.

2. For purposes of understanding, context, benchmarking, review current studies and band plans applicable to the region, and individual SADC nations, including the current SADC spectrum band plan covering spectrum use above 3.1 GHz and the applicable ITU plans.

3. Establish a regional band plan consistent with ITU guidelines for the region for frequency bands above 3.1 GHz.

4. Establish an initial consultative report outlining and highlighting key issues for consideration by regulators and policy makers in the region associated with the establishment of such a plan. The initial consultative study should also include preliminary recommendations and intentions for the plan.

5. Prepare a report in collaboration with relevant members of TRASA and their representatives outlining or highlighting the following;

    a. Key examples of best practices from other jurisdictions including international organizations;
    b. Models or conventions that should be considered for adoption throughout the SADC region based on models from jurisdictions either inside or beyond the SADC region;
    c. Key relevant contextual examples from within the region or within the community of developing nations;
    d. Key principles relating to the issues to help in the establishment of guidelines or models to TRASA members;
    e. Potential areas or specific issues to be addressed in establishing models or guidelines;
    f. Preliminary recommendations for the band plan;
    g. Identify proposed next steps toward implementation of the proposed guidelines by TRASA members; and
    h. Identify key challenges to be addressed my TRASA members or the region in addressing the challenges presented through implementation.

6. Prepare an outline for the initial review or study report on the issue in consultation with TRASA, the relevant TRASA oversight committee, and RAPID Team Leader. The outline will include preliminary views on jurisdictions to focus on or discuss in the review.

7. Travel as necessary to consult with relevant TRASA members or TRASA Committee members.

8. Identify the relevant institutions, associated resource issues, staff training requirements, hardware or software systems, and other foundation requirements necessary to implement the guidelines or models proposed for TRASA members.

9. Presentation of the findings and conclusions at relevant regional workshops.

Deliverables

a. Consultation with relevant TRASA committee(s) as appropriate and necessary.
b. Workshop Presentations/Participations (as required)
c. Technical Report containing current practices and findings.
d. Recommend next steps toward the development of a spectrum plan above the 3.1 GHz frequencies for adoption by the SADC region.

ANNEX B

AN OUTLINE OF THE PROPOSED SADC TABLE OF FREQUENCY ALLOCATIONS

AN OUTLINE OF THE PROPOSED SADC TABLE OF FREQUENCY ALLOCATIONS

General
The table presents an outline of the proposed Table of Frequency Allocations for the SADC Region in the frequency range 3.1 to 100 GHz. The table of allocations has the following columns:

Frequency Bands
This column indicates the frequency bands (in GHz) for the allocations.

ITU Region 1 Radio Regulations
This column shows the services allocated the frequency band in question for Region 1 by the ITU (Radio Regulations 2001).

ITU Region 2 Radio Regulations
This column shows the services allocated the frequency band in question for Region 2 by the ITU (Radio Regulations 2001). This column will be deleted at the end of the consultation process.

Main European Utilisation
This column shows the main uses for the bands in Europe as per the 2002 edition of the European Common Allocation Table. This column was included for the purposes of comparison only and will be deleted at the end of the consultation process.

Proposed SADC Common Allocation
This column shows the proposed common allocation in the various bands for the SADC Region.

Recommended Main Utilisation in SADC
This column shows the proposed main applications that will use the band in question. These allocations do not imply a priority or exclusivity status, unless stated otherwise. Other services that are shown under the column entitled 'Proposed SADC Common Allocations' in the band in question would still be allocated spectrum in that band on coordinated basis. In some cases the future usage of the spectrum in a particular band is uncertain in which case the column has been left blank.

Remarks
This column includes comments about allocations in Region 3, where such allocations differ either with those in Region 1, Region 2 or both. If the allocation in Region 3 is the same as that in both Region1 and Region2, no comment is made about the allocation in Region 3 in the Remarks column. If the allocation in Region 3 differs from both allocations in Regions 1 and 2, the allocation in Region 3 is shown in full. All information regarding allocations in Region 3 will be deleted at the end of the consultation process.

In addition, the Remarks column also includes general comments about spectrum usage as appropriate. Comments in square brackets are temporary comments to clarify certain issues during the consultation process and will be deleted in due course.

Recommended Channel Plans and Regional Footnotes
Annex 1 shows the recommended channel plans and regional footnotes for the proposed SADC Common Allocation Table. The proposed regional footnotes are designated with the letters SF #, where # is the footnote number.

Normally footnotes address issues relating to how various frequency bands should be used and the migration strategy. However, the TRASA Technical Committee decided that issues such equipment standards, whether a frequency band is used for narrow band or broadband Fixed Wireless Access, the migration strategy, etc. should be left to individual countries.

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
3100 – 3300	RADIOLOCATION Earth Exploration-Satellite (active) Space Research (active) 5.149 5.428		Radars and Active Sensors	RADIOLOCATION Earth Exploration-Satellite (active) Space Research (active) 5.149	Government Radiolocation.	
3300 –3400	RADIOLOCATION 5.149 5.429 5.430	RADIOLOCATION Amateur Fixed Mobile 5.149 5.430	Radars	RADIOLOCATION 5.149	Government Radiolocation.	**Region 3:** RADIOLOCATION Amateur.
3400 – 3500	FIXED FIXED-SATELLITE (space-to-Earth) Mobile Radiolocation 5.431	FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile Radiolocation 5.433 5.282, 5.432	Amateur applications EU17 Fixed Links Fixed Wireless Access Systems Radars SAP/SAB EU17A	FIXED SF1	Fixed Wireless Access	Region 3 same as Region 2.
3500 – 3600		FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.433 5.435	Fixed Links Fixed Wireless Access Systems Mobile Applications EU17A			
3600 – 3700	FIXED FIXED-SATELLITE (space-to-Earth) Mobile		Coordinated earth stations in FSS Fixed Wireless Access Systems Medium/High capacity fixed links.	FIXED SF2 FIXED-SATELLITE (space-to-Earth) SF3 SF4	Fixed Wireless Access Point-to-Point Fixed Links Coordinated FSS Applications	Region 3 same as Region 2
3700 – 4200		FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile				Region 3 same as Region 2

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
4200 – 4400	AERONAUTICAL RADIONAVIGATION 5.438 5.439 5.440		Earth Exploration Satellite systems Radio altimeters EU18	AERONAUTICAL RADIONAVIGATION 5.438 5.440	Radio altimeters	
4400 – 4500	FIXED MOBILE		Defense systems EU20 Mobile applications Transhorizon links. EU2 EU27	FIXED MOBILE	Government Utilisation	
4500 – 4800	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE		Coordinated earth stations in FSS Defence systems EU20 Mobile applications Transhorizon links EU27	FIXED FIXED-SATELLITE (space-Earth) 5.441 MOBILE	Government Utilisation	
4800 – 4990	FIXED MOBILE 5.442 Radio Astronomy 5.149 5.339 5.443		Defence systems EU20 Mobile applications Passive applications Radio Astronomy EU27	FIXED MOBILE 5.442 Radio Astronomy 5.149 5.339	Government Utilisation	
4990 – 5000	FIXED MOBILE except Aeronautical Mobile RADIO ASTRONOMY Space Research (passive) 5.149		Defence systems EU20 Mobile applications Radio astronomy applications EU27	FIXED MOBILE except Aeronautical Mobile RADIO ASTRONOMY Space Research (passive) 5.149	Government Utilisation	
5000 – 5150	AERONAUTICAL RADIONAVIGATION 5.367 5.443A 5.443B 5.444 5.444A		Radio astronomy applications MLS [5030 – 5150 GHz] EU18	AERONAUTICAL RADIONAVIGATION 5.367 5.443A 5.444B 5.444 5.444A	Microwave Landing systems.	NGSO MSS feeder Links (5091 – 5150 HMz)

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
5150 – 5250	AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.447A 5.446 5.447 5.447B 5.447C		Feeder links for the MSS HIPERLANs	AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.447A 5.447B 5.447C	NGSO MSS feeder links	Possible future use by HIPERLANs (5.150 – 5.350 GHz)
5250 – 5255	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.447D 5.448 5.448A		Active sensors HIPERLANs Position fixing Shipborne and VTS radar Tactical radars. Weapon system radars weather radar. EU22	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.447D 5.448A		Possible future use by HIPERLANs (5.150 – 5.350 GHz)
5255 – 5350	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.448 5.448A		Active sensors HIPERLANs Position fixing Shipborne and VTS radar Tactical radars Weapon system radars. Weather radar.	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.448A		Possible future use by HIPERLANs (5.150 – 5.350 GHz)
5350 – 5460	EARTH EXPLORATION-SATELLITE (active) 5.448B AERONAUTICAL RADIONAVIGATION 5.449 Radiolocation		Active sensors. Position fixing Shipborne and VTS radar Tactical radars Weapon system radars Weather radars EU22	EARTH EXPLORATION-SATELLITE (active) 5.448B AERONAUTICAL RADIONAVIGATION 5.449 Radiolocation	Weather Radar	
5460 – 5470	RADIONAVIGATION 5.449 Radiolocation		Position fixing. Shipborne and VTS radar Tactical radars Weapon system radars Weather radars EU22	RADIONAVIGATION 5.449 Radiolocation		

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
5470 – 5650	MARITIME RADIONAVIGATION Radiolocation 5.450 5.451 5.452		HIPERLANs Position fixing Shipborne and VTS radar Tactical radars Weapon system radars Weather radars. EU22	MARITIME RADIONAVIGATION Radiolocation 5.452		Possible future use by HIPERLANs (5.470 – 5.725 GHz)
5650 – 5725	RADIOLOCATION Amateur Space Research (deep space) 5.282 5.451 5.453 5.454 5.455		Amateur applications EU17 Amateur satellite applications(E/S)EU23 HIPERLANs Position fixing Shipborne and VTS radar Tactical radars Weapon system radars Weather radars EU17 EU22	RADIOLOCATION Amateur Space Research (deep space) 5.282		Possible future use by HIPERLANs (5.470 – 5.725 GHz)
5725 – 5830	FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur 5.150 5.451 5.453 5.455 5.456	RADIOLOCATION Amateur 5.150 5.453 5.455	Amateur applications ISM Non civil radiolocation Non specific SRD Road Transport and Traffic Telematic Systems(RTTT) Weather radars EU22	FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur 5.150	Short Range Devices - ISM (5725-5875 MHz, centre frequency 5800 MHz). Road Transport Informatics in the band 5795 - 5815 MHz	Region 3 same as Region 2
5830 – 5850	FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur Amateur-Satellite (space-to-Earth) 5.150 5.451 5.453 5.455 5.456	RADIOLOCATION Amateur Amateur-Satellite (space-to-Earth) 5.150 5.453 5.455	Amateur satellite applications(S/E)EU23 ISM Non Civil radiolocation Non specific SRD Weather radars EU22	FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur Amateur-Satellite (space-Earth) 5.150	Short Range Devices - ISM (5725-5875 MHz, centre frequency 5800 MHz).	Region 3 same as Region 2

Frequency bands (MHz)	**ITU Region 1 Radio Regulations**	**ITU Region 2 Radio Regulations**	**Main European Utilisation**	**Proposed SADC Common Allocation**	**Recommended Main Utilisation in SADC**	**Remarks**
5850 – 5925	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.150	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Amateur Radiolocation 5.150	Coordinated earth stations in FSS ISM Non specific SRD	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.150	Short Range Devices - ISM (5725 - 5875 MHz, centre frequency 5800 MHz) VSAT/SNG used on a coordinated basis.	**Region 3:** FIXED FIXED-SATELLITE (Earth-to-Space) MOBILE Radiolocation
5925 – 6700	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.149 5.440 5.458		Coordinated earth stations in FSS Medium/high capacity fixed links Earth Exploration Satellite systems	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.149 5.440 5.458	For coordinated earth stations in FSS. Point-to-point fixed links. VSAT/SNG used on a coordinated basis.	
6700 – 7075	FIXED FIXED-SATELLITE(Earth-to-space)(space-to-Earth)5.441 MOBILE 5.458 5.458A 5.458B 5.458C		Earth Exploration Satellite systems Feederlinks for MSS Fixed Satellite applications Medium/high capacity fixed links	FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B 5.458C	For high capacity point-to-point fixed links.	
7075 – 7125	FIXED MOBILE 5.458 5.459 5.460		Earth Exploration Satellite systems Medium/high capacity fixed links	FIXED MOBILE 5.458	Used mainly for medium and high capacity point-to-point fixed links.	
7125 – 7250			Earth Exploration satellite systems Fixed links			
7250 – 7300	FIXED FIXED-SATELLITE(Space-to-Earth) MOBILE 5.461		Defence systems Fixed links Mobile satellite applications EU2 EU27	FIXED FIXED-SATELLITE(Space-to-Earth) MOBILE 5.461	Used mainly for medium and high capacity point-to-point fixed links.	

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
7300 – 7450	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.461		Defence systems Fixed links Mobile satellite applications EU2 EU27	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 5.461	Used mainly for medium and high capacity point-to-point fixed links.	
7450 – 7550	FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except Aeronautical Mobile 5.461A		Defence systems Fixed links Metereological Satellite EU2 EU27	FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except Aeronautical Mobile 5.461A	Point-to-point fixed links.	
7550 – 7750	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except Aeronautical Mobile		Defence systems Fixed links EU2 EU27	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except Aeronautical Mobile	Point-to-point fixed links.	
7750 – 7850	FIXED METEOROLOGICAL -SATELLITE (space-to-Earth) 5.461B MOBILE except Aeronautical Mobile		Defence systems Fixed links Metereological Satellite EU2	FIXED METEOROLOGICAL -SATELLITE (space-to-Earth) 5.461B MOBILE except Aeronautical Mobile	Point-to-point fixed links.	
7850 – 7900	FIXED MOBILE except Aeronautical Mobile		Defence systems. Fixed links	FIXED MOBILE except Aeronautical Mobile	Point-to-point fixed links.	
7900 – 8025	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.461		Defence systems Fixed links Mobile satellite applications EU2 EU27	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.461	Point-to-point fixed links.	

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
8025 – 8175	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A		Defence systems. Earth exploration satellite systems Fixed links Mobile applications. EU2 EU27	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	Point-to-point fixed links.	
8175 – 8215	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A		Defence systems. Earth exploration satellite systems. Fixed links Mobile applications EU2 EU27	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	Point-to-point fixed links.	
8215 – 8400	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A		Defence systems. Earth exploration satellite systems. Fixed links Radio astronomy applications EU2 EU27	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	Point-to-point fixed links.	
8400 – 8500	FIXED MOBILE except Aeronautical Mobile SPACE RESEARCH (space-to-Earth) 5.465 5.466 5.467		Fixed links	FIXED MOBILE except Aeronautical Mobile SPACE RESEARCH (space-to-earth) 5.465	Point-to-point fixed links.	

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
8500 – 8550	RADIOLOCATION 5.468 5.469		Civil and military aeronautical radionavigation systems e.g. airfield approach. Shipborne, land and airborne surveillance and weapon radars. EU2 EU24	RADIOLOCATION	Radars	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.
8550 – 8650	EARTH EXPLORATION SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.468 5.469 5.469A		Civil and military aeronautical radionavigation systems e.g. airfield approach. Shipborne, land and airborne surveillance and weapon radars. Space borne active sensors. EU2 EU24	EARTH EXPLORATION-SATELLITE (space-to-Earth) RADIOLOCATION SPACE REASERCH (active) 5.469A	Radars	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.
8650 – 8750	RADIOLOCATION 5.468 5.469		Civil and military aeronautical radionavigation systems e.g. airfield approach. Shipborne, land and airborne surveillance and weapon radars. EU2 EU24	RADIOLOCATION	Radars	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
8750 – 8850	RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470 5.471		Civil and military aeronautical radionavigation systems e.g. airfield approach. Shipborne, land and airborne surveillance and weapon radars. EU2 EU24	RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470	Radars	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.
8850 – 9000	RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473		Civil and military aeronautical radionavigation systems e.g. airfield approach. Shipborne, land and airborne surveillance and weapon radars. EU2 EU24	RADIOLOCATION MARITIME RADIONAVIGATION 5.472	Radars.	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.
9000 – 9200	AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.471		Civil and military aeronautical radionavigation systems e.g. airfield approach. Shipborne, land and airborne surveillance and weapon radars. EU2 EU24	AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation	Radars.	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.

Frequency bands (MHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
9200 – 9300	RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473 5.474		Civil and military aeronautical radionavigation systems e.g. airfield approach. Shipborne, land and airborne surveillance and weapon radars. EU2 EU24	RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.474	Radars.	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.
9300 – 9500	RADIONAVIGATION 5.476 Radiolocation 5.427 5.474 5.475		Civil and military aeronautical radionavigation systems e.g. airfield approach. Shipborne, land and airborne surveillance and weapon radars. EU2 EU24	RADIONAVIGATION 5.476 Radiolocation 5.427 5.474 5.475	Radars.	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.
9500 – 9800	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active) 5.476A		Civil and military aeronautical radionavigation systems e.g. airfield approach. Motion sensors Shipborne, land and airborne surveillance and weapon radars. Space borne active sensors EU2 EU24	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active) 5.476A	Radars.	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.

Frequency bands (MHz)	**ITU Region 1 Radio Regulations**	**ITU Region 2 Radio Regulations**	**Main European Utilisation**	**Proposed SADC Common Allocation**	**Recommended Main Utilisation in SADC**	**Remarks**
9800 – 10000	RADIOLOCATION Fixed 5.477 5.478 5.479		Civil and military aeronautical radionavigation systems e.g. airfield approach. Motion sensors Shipborne, land and airborne surveillance and weapon radars. EU2 EU24	RADIOLOCATION Fixed 5.479	Radars	Civil and military aeronautical radionavigation e.g. precision airfield approach radars.

Frequency bands (GHz)	**ITU Region 1 Radio Regulations**	**ITU Region 2 Radio Regulations**	**Main European Utilisation**	**Proposed SADC Common Allocation**	**Recommended Main Utilisation in SADC**	**Remarks**
10 - 10.15	FIXED MOBILE RADIOLOCATION Amateur 5.479	RADIOLOCATION Amateur 5.479 5.480	Amateur applications Non civil radar SAP/SAB applications EU2 EU17A	FIXED MOBILE RADIOLOCATION Amateur 5.479 SF5	Fixed Wireless Access.	Region 3 same as Region 1
10.15 – 10.3			Amateur applications Civil and military radars Fixed links Fixed wireless access systems SAP/SAB applications EU2 EU17A			
10.3 – 10.45			Amateur applications Civil and military radar SAP/SAB applications EU2 EU17 EU17A.			
10.45 – 10.5	RADIOLOCATION Amateur Amateur-Satellite 5.481		Amateur applications EU23 Amateur Satellite applications EU23 Civil and military radar Fixed links SAP/SAB applications EU2 EU17 EU17A.	RADIOLOCATION Amateur Amateur-Satellite		
10.5 – 10.55	FIXED MOBILE Radiolocation	FIXED MOBILE RADIOLOCATION	Fixed links Fixed wireless access systems Motion sensors SAP/SAB applications EU17A.	FIXED SF5	Fixed Wireless Access.	Region 3 same as Region 2
10.55 – 10.6	FIXED MOBILE except Aeronautical Mobile Radiolocation		Fixed links Fixed wireless access systems Motion sensors SAP/SAB applications EU17A.	FIXED SF5	Fixed Wireless Access.	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
10.6 – 10.65	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except Aeronautical Mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482		Fixed links Fixed wireless access systems Passive applications. SAP/SAB applications EU17A	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except Aeronautical Mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482 SF5	Fixed Wireless Access.	
10.65 – 10.68			Fixed links Passive applications SAP/SAB applications EU17A			
10.68 - 10.7	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.483		Passive applications	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.483		
10.7 - 11.7	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A (Earth-to-space) 5.484 MOBILE except Aeronautical Mobile	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A MOBILE except Aeronautical Mobile	Fixed links Fixed Satellite Service applications	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A (Earth-to-space) 5.484	Point-to-point fixed links. Fixed Satellite Service applications	Region 3 same as Region 2

Frequency bands (GHz)	**ITU Region 1 Radio Regulations**	**ITU Region 2 Radio Regulations**	**Main European Utilisation**	**Proposed SADC Common Allocation**	**Recommended Main Utilisation in SADC**	**Remarks**
11.7 - 12.1	FIXED BROADCASTING BROADCASTING-SATELLITE Mobile except aeronautical Mobile 5.487 5.487A 5.492	FIXED 5.486 FIXED-SATELLITE (Space-to-Earth) 5.484A Mobile except aeronautical Mobile 5.485 5.488	Satellite broadcasting EU28	FIXED BROADCASTING BROADCASTING-SATELLITE Mobile except Aeronautical Mobile 5.487 5.487A 5.492		**Region 3:** FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.487 5.487A 5.492
12.1 – 12.2		FIXED-SATELLITE (space-to-Earth) 5.484A 5.485 5.488 5.489				
12.2 – 12.5		FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.487A 5.488 5.490 5.492				Region 3: FIXED MOBILE except aeronautical mobile BROADCASTING 4.484A 5.487 5.491
12.5 - 12.7	FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.494 5.495 5.496		Fixed Satellite Service applications	FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space)	Fixed Satellite Service applications	**Region 3:** FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE except aeronautical mobile BROADCASTING-SATELLITE 5.493
12.7 – 12.75		FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile				
12.75 - 13.25	FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space Research (deep space)(space-to-Earth)		Fixed links Fixed Satellite Service applications	FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space Research (deep space)(space-to-Earth)	Point-to-point Fixed Links Fixed Satellite Service applications	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
13.25 - 13.4	EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A 5.499		Doppler Navigation Aids. Earth exploration observations. Ship berthing radars EU26	EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A 5.499	Airborne Doppler Radar.	
13.4 - 13.75	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.501A Standard Frequency and time signal-satellite (Earth-to-space) 5.499 5.500 5.501 5.501B		Doppler navigation aids. Military land, airborne and naval radars. Motion sensors Ship berthing radars EU2 EU26	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.501A Standard Frequency and Time Signal-Satellite (Earth-space) 5.501B		
13.75 – 14	FIXED-SATELLITE (Earth-to-space) 5.484A RADIOLOCATION Standard frequency and time signal-satellite (Earth-to-space) Space Research 5.499 5.500 5.501 5.502 5.503 5.503A		Fixed Satellite Service applications Military lan, airborne and naval radars Motion sensors Navigation radars Passive applications Ship berthing radars EU2 EU26	FIXED-SATELLITE (Earth-to-space) 5.484A RADIOLOCATION Standard Frequency and Time Signal-Satellite (Earth-to-space) Space Research 5.502 5.503 5.503A	Fixed Satellite Service applications	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
14 - 14.25	FIXED-SATELLITE (Earth-to-space) 5.484 A 5.506 RADIONAVIGATION 5.504 Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Space Research 5.505		Mobile satellite systems. VSAT/SNG applications.	FIXED-SATELLITE (Earth-to-space) 5.484 A 5.506 RADIONAVIGATION 5.504 Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Space Research 5.505	Fixed Satellite Service applications	
14.25 - 14.3	FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) except aeronautical mobile-satellite Space Research 5.505 5.508 5.509		Mobile satellite systems VSAT/SNG applications.	FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 RADIONAVIGATION 5.504 Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Space Research 5.505 5.508 5.509	VSAT/SNG	
14.3 - 14.4	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) except aeronautical mobile-satellite Radionavigation-satellite	FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 Mobile-satellite (Earth-to-space) except aeronautical mobile-satellite Radionavigation-satellite	Fixed and mobile Satellite Service applications VSAT/SNG applications.	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 MOBILE except Aeronautical Mobile Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Radionavigation-Satellite	VSAT/SNG	Region 3 same as Region 1

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
14.4 - 14.47	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 MOBILE except aeronautical Mobile Mobile-satellite (Earth-to-space) except aeronautical mobile-satellite Space Research (space-to-Earth)		Fixed and Mobile Satellite Service applications VSAT/SNG applications.	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 MOBILE except Aeronautical Mobile Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Space Research (space-to-Earth)	VSAT/SNG	
14.47 - 14.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 MOBILE except aeronautical Mobile Mobile-satellite (Earth-to-space) except aeronautical mobile-satellite Radio Astronomy 5.149		Fixed and Mobile Satellite Service applications Radio astronomy applications VSAT/SNG applications.	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.506 MOBILE except Aeronautical Mobile Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Radio Astronomy 5.149	VSAT/SNG	For VSAT/SNG use.
14.5 - 14.8	FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space Research		Defence systems EU20 Fixed links EU20 Radio astronomy applications EU27	FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space Research	Point-to-point Fixed Links. Fixed Satellite Service applications	
14.8 - 15.35	FIXED MOBILE Space Research 5.339		Defence systems EU20 Fixed links EU20 Radio astronomy applications EU27	FIXED MOBILE Space Research 5.339	Point-to-point Fixed Links.	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
15.35 - 15.4	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511		Passive applications	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340		
15.4 - 15.43	AERONAUTICAL RADIONAVIGATION 5.511D		Doppler radar low power sensing. Ground movement radars.	AERONAUTICAL RADIONAVIGATION 5.511D	Radio altimeters/ Radars	
15.43 – 15.63	FIXED-SATELLITE (Earth-to-space) 5.511A AERONAUTICAL RADIONAVIGATION 5.511C		Doppler radar low power sensing. Fixed Satellite Service applications Ground movement radars.	FIXED-SATELLITE (space-to-Earth)(Earth-to-space) 5.511A AERONAUTICAL RADIONAVIGATION 5.511C	Radars	
15.63 – 15.7	AERONAUTICAL RADIONAVIGATION 5.511D		Doppler radar low power sensing. Ground movement radars.	AERONAUTICAL RADIONAVIGATION 5.511D	Radars	
15.7 - 16.6	RADIOLOCATION 5.512 5.513		Defence systems EU27	RADIOLOCATION	Goovernment Utilisation	
16.6 - 17.1	RADIOLOCATION Space Research (deep space)(Earth-to-space) 5.512 5.513		Defence systems EU27	RADIOLOCATION Space Research (deep space)(Earth-to-space)		
17.1 - 17.2	RADIOLOCATION 5.512 5.513		Defence systems. HIPERLANs EU2	RADIOLOCATION		Possible future use for HIPERLAN.
17.2 - 17.3	EARTH EXPLORATION- SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.512 5.513 5.513A		Airborne terrain following radars. Defence systems HIPERLANs Missile systems radars EU2	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.513A		Possible future use for HIPERLAN.

Frequency bands (GHz)	**ITU Region 1 Radio Regulations**	**ITU Region 2 Radio Regulations**	**Main European Utilisation**	**Proposed SADC Common Allocation**	**Recommended Main Utilisation in SADC**	**Remarks**
17.3 - 17.7	FIXED-SATELLITE (Earth-to-space) 5.516 Radiolocation 5.514	FIXED-SATELLITE (Earth-to-space) 5.516 BROADCASTING-SATELLITE Radiolocation 5.514 5.515 5.517	Defence systems Feeder links plan EU2	FIXED-SATELLITE (Earth-to-space) 5.516 [FIXED] SF6 Radiolocation 5.514	Point-to-point links	Region 3 same as Region 1 Future use of BSS feeder links. Future use for FSS/SNG applications. There is an agenda item of WRC-03 to possibly introduce a primary FS allocation in this band.
17.7 – 17.8	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) S5.516 MOBILE	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.518 5.515 5.517	Feeder link plan Fixed links. Fixed Satellite Service applications	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	Point-to-point fixed links	Region 3 same as Region 1 Future use of BSS feeder links.
17.8 – 18.1		FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE				
18.1 - 18.3	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.520 MOBILE 5.519 5.521		Feeder link band Fixed links Fixed Satellite Service applications	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.520 MOBILE 5.519 5.521	Point-to-point fixed links. Fixed Satellite Service applications	
18.3 – 18.4			Feeder links band Fixed links Fixed Satellite Service applications			

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
18.4 - 18.6	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE		Fixed links. Fixed Satellite Service applications	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE	Point-to-point fixed links Fixed Satellite Service applications.	
18.6 - 18.8	EARTH EXPLORATION-SATELLITE(passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical Mobile Space Research (passive) 5.522A 5.522C	EARTH EXPLORATION SATELLITE(passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical Mobile SPACE RESEARCH (passive) 5.522A	Fixed links. Fixed Satellite Service applications. Passive applications	FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except Aeronautical Mobile EARTH EXPLORATION-SATELLITE (passive) Space Research (passive) 5.522A	Point-to-point fixed links Fixed Satellite Service applications	Region 3 same as Region 1
18.8 - 19.3	FIXED FIXED-SATELLITE (space-to-Earth) 5.523A MOBILE		Fixed links. Fixed Satellite Service applications.	FIXED FIXED-SATELLITE (space-to-Earth) 5.523A MOBILE	Point-to-point fixed links Fixed Satellite Service applications	
19.3 – 19.7	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.523B 5.523C 5.523D 5.523E MOBILE		Fixed links Fixed Satellite Service applications	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.523B 5.523C 5.523D 5.523E MOBILE	Point-to-point fixed links Fixed Satellite Service applications	
19.7 - 20.1	FIXED-SATELLITE (space-to-Earth) 5.484A Mobile-Satellite (space-to-Earth) 5.524	FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528 5.529	Fixed and Mobile Satellite Service applications	FIXED-SATELLITE (space-to-Earth) 5.484A Mobile-Satellite (space-to-Earth)	Fixed Satellite Service applications..	Region 3 same as Region 1

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
20.1 - 20.2	FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE-SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528		Fixed and Mobile Satellite Service applications	FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE-SATELLITE (space-to-Earth) 5.525 5.526 5.527 5.528	Fixed Satellite Service applications.	
20.2 - 21.2	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard frequency and time signal-satellite(space-to-Earth) 5.524		Fixed and Mobile Satellite Service applications EU2 EU27	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard Frequency and Time Signal-Satellite (space-to-Earth)	Government Utilisation.	
21.2 - 21.4	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)		Passive applications Unidirectional temporary fixed or mobile links	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)		
21.4 - 22	FIXED MOBILE BROADCASTING-SATELLITE 5.530	FIXED MOBILE	Wide band high definition television	FIXED MOBILE BROADCASTING-SATELLITE 5.530		Region 3 is the same as Region 1 except for the inclusion of footnote 5.531
22 - 22.21	FIXED MOBILE except aeronautical Mobile 5.149		Fixed links. Passive applications. SAP/SAB applications EU17A	FIXED MOBILE except Aeronautical Mobile 5.149	Point-to-point fixed links	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
22.21 - 22.5	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical Mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 5.149 5.532		Fixed links. Radio astronomy applications SAP/SAB applications EU17A	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except Aeronautical Mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 5.149 5.532	Point-ot-point fixed links	
22.5 - 22.55	FIXED MOBILE		Fixed links. Radio Astronomy applications SAP/SAB applications EU17A	FIXED MOBILE	Point-to-point fixed links	
22.55 – 22.6	FIXED INTER-SATELLITE MOBILE 5.149		Fixed links. Radio Astronomy applications. SAP/SAB applications EU17A.	FIXED INTER-SATELLITE MOBILE 5.149	Point-to-point fixed links	
22.6 – 23			Radio astronomy applications SAP/SAB applications EU17A			
23 – 23.55			Fixed links Radio astronomy applications SAP/SAB applications			
23.55 - 23.6	FIXED MOBILE		Fixed links. SAP/SAB applications.	FIXED MOBILE	Point-to-point fixed links	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
23.6 - 24	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340		Passive applications.	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340		
24 - 24.05	AMATEUR AMATEUR-SATELLITE 5.150		Amateur applications Amateur Satellite applications ISM Non specific SRD SAP/SAB applications.	AMATEUR AMATEUR-SATELLITE	The band 24 - 24.25 GHz (centre frequency 24.125 GHz) is reserved for future ISM applications.	
24.05 - 24.25	RADIOLOCATION Amateur Earth Exploration-Satellite (active) 5.150		Amateur applications Defence systems ISM Motion sensors Non specific SRD Rain radar from satellites SAP/SAB applications. EU2	RADIOLOCATION Amateur Earth Exploration-Satellite (active) 5.150	The band 24 - 24.25 GHz (centre frequency 24.125 GHz) is reserved for future ISM applications.	
24.25 - 24.45	FIXED	RADIONAVIGATION	SAP/SAB applications Unidirectional temporary fixed links EU17A	FIXED	Temporary Fixed (video and radiocamera) Links for ENG/OB	**Region 3:** RADIONAVIGATION FIXED MOBILE
24.45 - 24.5	FIXED INTER-SATELLITE	INTER-SATELLITE RADIONAVIGATION 5.533	SAP/SAB applications Unidirectional temporary fixed links EU17A	FIXED INTER-SATELLITE	Temporary Fixed (video and radiocamera) Links for ENG/OB	**Region 3:** FIXED INTERSATELLITE MOBILE RADIONAVIGATION 5.533 FWA (24.5 – 25.5 GHz)/ (25.5 - 26.5 GHz)
24.5 – 24.65			Fixed links. Fixed wireless access systems		Point-to-point fixed links Fixed Wireless Access	

Frequency bands (GHz)	**ITU Region 1 Radio Regulations**	**ITU Region 2 Radio Regulations**	**Main European Utilisation**	**Proposed SADC Common Allocation**	**Recommended Main Utilisation in SADC**	**Remarks**
24.65 - 24.75	FIXED INTER-SATELLITE	INTER-SATELLITE RADIOLOCATION-SATELLITE(Earth-to-space)	Fixed links. Fixed wireless access systems	FIXED INTER-SATELLITE	Point-to-point fixed links Fixed Wireless Access	**Region 3:** FIXED INTERSATELLITE MOBILE RADIONAVIGATION 5.533 5.534 FWA (24.5 – 25.5 GHz)/ (25.5 - 26.5 GHz)
24.75 - 25.25	FIXED	FIXED-SATELLITE (Earth-to-space) 5.535	Fixed links Fixed wireless access systems	FIXED	Point-to-point fixed links Fixed Wireless Access	**Region 3:** FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE 5.534 FWA (24.5 – 25.5 GHz)/ (25.5 - 26.5 GHz)
25.25 – 25.5	FIXED INTER-SATELLITE 5.536 MOBILE Standard Frequency and Time Signal-Satellite(Earth-to-space)		Fixed links. Fixed wireless access systems	FIXED INTER-SATELLITE 5.536 MOBILE Standard Frequency and Time Signal-Satellite(Earth-to-space)	Point-to-point fixed links Fixed Wireless Access	FWA (24.5 – 25.5 GHz)/ (25.5 - 26.5 GHz)
25.5 – 26.5	EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536A 5.536B FIXED INTER-SATELLITE 5.536 MOBILE Standard frequency and time signal-satellite (Earth-to-space)		Fixed links. Fixed wireless access systems	EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536A FIXED INTER-SATELLITE 5.536 MOBILE Standard Frequency and Time Signal-Satellite (Earth-to-space)	Point-to-point fixed links Fixed Wireless Access	FWA (24.5 – 25.5 GHz)/ (25.5 - 26.5 GHz)
26.5 – 27			Defence systems EU27			

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
27 – 27.5	FIXED INTER-SATELLITE 5.536 MOBILE	FIXED FIXED-SATELLITE(Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE	Defence systems EU27	FIXED INTER-SATELLITE 5.536 MOBILE	Government Utilisation.	Region 3 same as Region 2
27.5 – 28.5	FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 MOBILE 5.538 5.540		Feeder links band Fixed links Fixed Satellite Service applications Fixed wireless access systems	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 MOBILE 5.538 5.540	Feeder links band Point-to-point fixed links Fixed Satellite Service applications Fixed wireless access systems	For the band 27.5 – 29.5 GHz: Feeder Links to BSS (27.5 – 29.5 GHz) Fixed Links (28.0525 – 28.4445 GHz) FSS (E-s) (27.5 – 27.8285 GHz) FSS (s-E) (27.5 – 27.501 GHz) FWA (28.5 – 29.5 GHz)/ (27.5 – 28.5 GHz)
28.5 – 29.1	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540		Feeder links band Fixed links Fixed Satellite Service applications Fixed wireless access systems	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.523A 5.539 MOBILE Earth Exploration-Satellite (Earth-to-space) 5.541 5.540	Feeder links band Point-to-point fixed links Fixed Satellite Service applications Fixed wireless access systems	For the band 27.5 – 29.5 GHz: Feeder Links to BSS (27.5 – 29.5 GHz) Fixed Links (28.0525 – 28.4445 GHz) FSS (E-s) (27.5 – 27.8285 GHz) FSS (s-E) (27.5 – 27.501 GHz) FWA (28.5 – 29.5 GHz)/ (27.5 – 28.5 GHz)
29.1 – 29.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.523C 5.523E 5.535A 5.539 5.541A MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540		Feeder links band Fixed links Fixed Satellite Service applications Fixed wireless access systems	FIXED FIXED-SATELLITE (Earth-to-space) 5.523C 5.523E 5.535A 5.539 5.541A MOBILE Earth Exploration-Satellite (Earth-to-space) 5.541 5.540	Feeder links band Point-to-point fixed links Fixed Satellite Service applications Fixed wireless access systems	For the band 27.5 – 29.5 GHz: Feeder Links to BSS (27.5 – 29.5 GHz) Fixed Links (28.0525 – 28.4445 GHz) FSS (E-s) (27.5 – 27.8285 GHz) FSS (s-E) (27.5 – 27.501 GHz) FWA (28.5 – 29.5 GHz)/ (27.5 – 28.5 GHz)

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
29.5 - 29.9	FIXED-SATELLITE (Earth-to-space) 5.484 A 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542	FIXED-SATELLITE (Earth-to-space) 5.484 A 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite(Earth-to-space) 5.541 5.525 5.526 5.527 5.529 5.540 5.542	Fixed and mobile Satellites Service applications	FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 Earth Exploration-Satellite (Earth-to-space) 5.541 Mobile-Satellite (Earth-to-space) 5.540	Fixed Satellite Service applications.	Region 3 same as Region 1
29.9 – 30	FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 MOBILE-SATELLITE (Earth-to-Space) Earth exploration-satellite (Earth-to-space) 5.541 5.543 5.525 5.526 5.527 5.538 5.540 5.542		Fixed Satellite applications Mobile satellite systems.	FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 MOBILE-SATELLITE (Earth-to-Space) Earth Exploration-Satellite (Earth-to-space) 5.541 5.543 5.525 5.526 5.527 5.538 5.540	Fixed Satellite Service applications.	
30 – 31	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard frequency and time signal-satellite (space-to-Earth) 5.542		Fixed and Mobile Satellite Service applications EU2 EU27	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard Frequency and Time Signal-Satellite (space-to-Earth)		
31 - 31.3	FIXED 5.543A MOBILE Standard frequency and time signal-satellite (space-to-Earth) Space Research 5.544 5.545 5.149		Fixed links. Radio astronomy applications	FIXED MOBILE Standard Frequency and Time Signal-Satellite (space-to-Earth) Space Research 5.544 5.149	Point-to-point fixed links	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
31.3 - 31.5	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340		Passive applications. Surface temperature and emissivity, atmospheric attenuation.	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340		
31.5 - 31.8	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.546	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	Fixed links Passive applications Surface temperature and emissivity, atmospheric attenuation	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except Aeronautical Mobile 5.149		Region 3 same as Region 1
31.8 – 32	FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space)(space-to-Earth) 5.547 5.547B 5.548		High density fixed links.	FIXED S5.547A RADIONAVIGATION SPACE RESEARCH (deep space)(space-to-Earth) 5.547 5.548	High density fixed links.	
32 - 32.3	FIXED 5.547A INTER-SATELLITE RADIONAVIGATION SPACE RESEARCH (deep space)(space-to-Earth) 5.547 5.547C 5.548		High density fixed links.	FIXED 5.547A INTER-SATELLITE RADIONAVIGATION SPACE RESEARCH (deep space)(space-to-Earth) 5.547 5.548	High density fixed links.	
32.3 – 33	FIXED 5.547A INTER-SATELLITE RADIONAVIGATION 5.547 5.547D 5.548		High density fixed links	FIXED 5.547A INTER-SATELLITE RADIONAVIGATION 5.547 5.548	High density fixed links.	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
33 - 33.4	FIXED 5.547A RADIONAVIGATION 5.547 5.547E		High density fixed links.	FIXED 5.547A RADIONAVIGATION 5.547	High density fixed links.	
33.4 - 34.2	RADIOLOCATION 5.549		Defence systems Motion sensors Short range radar Surveying and measurement. EU2 EU27	RADIOLOCATION	Government utilisation.	
34.2 - 34.7	RADIOLOCATION SPACE RESEARCH (deep space)(Earth-to-space) 5.549		Defence systems Motion sensors Short range radar Surveying and measurement. EU2 EU27	RADIOLOCATION SPACE RESEARCH (deep space)(Earth-to-space)	Government utilisation.	
34.7 - 35.2	RADIOLOCATION Space Research 5.550 5.549		Defence systems Motion sensors Short range radar Surveying and measurement. EU2 EU27	RADIOLOCATION Space Research	Government utilisation.	
35.2 – 35.5	METEOROLOGICAL AIDS RADIOLOCATION 5.549		Defence systems Rain radar from satellites. EU2 EU27	METEOROLOGICAL AIDS RADIOLOCATION	Government utilisation.	
35.5 –36	METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.549 5.551A		Defence systems Rain radar from satellite. EU2 EU27	METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.551A	Government utilisation.	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
36 – 37	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149		Defence systems Passive applications Radio astronomy applications. EU27	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149	Government utilisation.	
37 - 37.5	FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.547		High density fixed links Low and medium capacity fixed links Unplanned uncoordinated use. EU2	FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.547	High density fixed links	
37.5 – 38	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA MOBILE SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547		Fixed Satellite Service applications High density fixed links Low capacity fixed links EU2	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA MOBILE SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	High density fixed links	
38 - 39.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA MOBILE Earth exploration-satellite (space-to-Earth) 5.547		Fixed Satellite Service applications High density fixed links Low capacity fixed links Unplanned, uncoordinated use EU2	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA MOBILE Earth exploration-satellite (space-to-Earth) 5.551AA 5.547	High density fixed links	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
39.5 – 40	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA MOBILE MOBILE-SATELLITE (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547		Fixed Satellite Service applications EU2	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) 5.551AA Earth exploration-satellite (space-to-Earth) 5.547		
40 - 40.5	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)		Broadband mobile systems Fixed Satellite applications EU2	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	Government use.	
40.5 – 41	FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile 5.547	FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile Mobile-satellite(space-to-Earth) 5.547	Fixed Satellite Service applications Multimedia Wireless Systems MWS.	FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile 5.547		Region 3 same as Region 1. Possible future use for Multimedia Wireless Systems (including multipoint Video Distribution Systems) in the band 40.5 – 43.5 GHz.

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
41 – 42.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA BROADCASTING BROADCASTING-SATELLITE Mobile 5.547 5.551F 5.551G		Fixed Satellite Service applications Multimedia Wireless Systems MWS	FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile 5.551G 5.547		Possible future use for Multimedia Wireless Systems (including multipoint Video Distribution Systems) in the band 40.5 – 43.5 GHz.
42.5 - 43.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.552 MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149 5.547		Broadband mobile systems Fixed Satellite Service applications Multimedia Wireless Systems MWS Radio astronomy applications.	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except Aeronautical Mobile RADIO ASTRONOMY 5.149 5.547		Possible future use for Multimedia Wireless Systems (including multipoint Video Distribution Systems) in the band 40.5 – 43.5 GHz.
43.5 – 47	MOBILE 5.553 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554		Defence Systems (43.5 – 45.5 GHz) EU27	MOBILE 5.553 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554	The band 43.5-45.5 GHz for Government use.	
47 - 47.2	AMATEUR AMATEUR-SATELLITE		Amateur applications Amateur Satellite applications	AMATEUR AMATEUR-SATELLITE	Amateur applications Amateur Satellite applications	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
47.2 – 48.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.149 5.340 5.552A 5.555		Feeder links Fixed Satellite Service applications HAPS SAP/SAB applications	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.149 S5.340 5.552A 5.555	Fixed Satellite Service applications	BSS feeder links. The bands 47.2-47.5 GHz and 47.9-48.2 GHz for for possible future use by High Altitude Platform Stations.
48.5 – 50.2			Feeder link band Fixed Satellite Service applications Low and medium capacity fixed links Radio astronomy applications SAP/SAB applications			
50.2 - 50.4	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.555A		Passive applications	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.555A		
50.4 - 51.4	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Mobile-Satellite (Earth-to-space)		Future satellite and terrestrial systems EU2	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Mobile-Satellite (Earth-to-space)		
51.4 - 52.6	FIXED MOBILE 5.547 5.556		High density fixed links.	FIXED MOBILE 5.547 5.556	High density fixed links	
52.6 – 54.25	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.556		Passive applications.	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.556		

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
54.25 - 55.78	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive) 5.556B		Passive applications.	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive)		
55.78 - 56.9	EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557		High density fixed links Passive applications. EU21	EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	High density fixed links	
56.9 - 57	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.558A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557		High density fixed links Passive applications. EU21	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.558A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	High density fixed links	
57 – 58.2	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557		High density fixed links Passive applications.	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547	High density fixed links	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
58.2 – 59	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.547 5.556		High density fixed links Passive applications EU6 EU19	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.547 5.556	High density fixed links	
59 – 59.3	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 RADIOLOCATION 5.559 SPACE RESEARCH (passive)		Defence systems Passive applications EU2 EU27	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 RADIOLOCATION 5.559 SPACE RESEARCH (passive)	Government.	
59.3 – 62	FIXED INTER-SATELLITE MOBILE 5.558 RADIOLOCATION 5.559 5.138		Cordless local area networks Defence systems High density fixed links ISM Non specific SRD EU2 EU27	FIXED INTER-SATELLITE MOBILE 5.558 RADIOLOCATION 5.559 5.138	The band 61-61.5 GHz (centre frequency 61.25 GHz) for future ISM use. The band 59 - 61 GHz for Government use.	
62 – 63			Broadband mobile systems Short range non civil radiolocation EU2		Broadband mobile systems	
63 – 64			RTTT Short range non civil radiolocation		The band 63 – 64 GHz might be used for transport applications.	

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
64 – 65	FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.547 5.556		High density fixed links	FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.547 5.556	High density fixed links	
65 – 66	EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH 5.547		Broadband mobile systems High density fixed links	EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH 5.547	High density fixed links	
66 – 71	INTER-SATELLITE MOBILE 5.553 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554		Future civil systems	INTER-SATELLITE MOBILE 5.553 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554		
71 – 74	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)		Defence systems. EU27	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	Government.	
74 – 75.5	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space Research (space-to-Earth) 5.559A 5.561		Future civil systems. Space science services	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE BROADCASTING BROADCASTING-SATELLITE Space Research (space-to-Earth) 5.561		
75.5 – 76			Amateur applications Future civil systems Space science services EU2			

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
76 – 77.5	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space Research (space-to-Earth) 5.149		Amateur applications Amateur Satellite applications Civil radiolocation Radio astronomy applications RTTT EU2	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space Research (space-to-Earth) 5.149	Road Transport and Traffic Telematics Radar (76 – 77 GHz)	
77.5 – 78	AMATEUR AMATEUR-SATELLITE Radio astronomy Space research (space-to-Earth) 5.149		Radio astronomy applications	AMATEUR AMATEUR-SATELLITE Radio astronomy Space research (space-to-Earth) 5.149		
78 – 79	RADIOLOCATION Amateur Amateur-satellite Radio astronomy Space research (space-to-Earth) 5.149 5.560		Civil and military radiolocation. Radio astronomy applications	RADIOLOCATION Amateur Amateur-satellite Radio astronomy Space research (space-to-Earth) 5.149 5.560		
79 - 81	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149		Civil and military radiolocation. Radio astronomy applications EU2	RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149		

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
81 - 84	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space Research (space-to-Earth) 5.149 5.561A		Defence systems. Radio astronomy applications EU27	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space Research (space-to-Earth) 5.149 5.560A		
84 - 86	FIXED FIXED-SATELLITE (Earth-to-space) 5.561B MOBILE RADIO ASTRONOMY 5.149		Future civil fixed and mobile systems Radio astronomy applications	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149		
86 - 92	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340		Passive applications.	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340		
92 - 94	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149		Radio astronomy applications Short range radar EU2	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149		
94 – 94.1	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Radio astronomy 5.562 5.562A		Cloud profiler radar Short range radar. EU2	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Radio astronomy 5.562 5.562A		

Frequency bands (GHz)	ITU Region 1 Radio Regulations	ITU Region 2 Radio Regulations	Main European Utilisation	Proposed SADC Common Allocation	Recommended Main Utilisation in SADC	Remarks
94.1 – 95	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149		Radio astronomy applications Short range radar. EU2	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149		
95 - 100	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554		Radio Astronomy applications. EU2	FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554		

ANNEX 1

Recommended Channel Plans and Regional Footnotes for use with the SADC Band Plan

1. Recommended Channel Plans

The following are the recommended channel plans for the respective frequency bands in the draft SADC Band Plan.

Recommended Channel Plan	Bands
CEPT/ERC/REC 14-03 Annex B	3400 - 3600 MHz
ITU-R Recommendation F.635 Annex 1.6	3600 - 4200 MHz
ITU-R Recommendation F.383	5925 – 6425 MHz
ITU-R Recommendation F.384	6425 – 7110 MHz
ITU-R Recommendation F.385 Annex 3	7110 – 7425 MHz 7425 – 7750 MHz
ITU-R Recommendation F.386 Annex 1	7725 – 8275 MHz
ITU-R Recommendation F.386 Annex 3	8275 – 8500 MHz
CEPT/ERC/REC 12-05 Annex A	10.15 – 10.3 GHz 10.5 – 10.65 GHz
ITU-R Recommendation F.387	10.7 – 11.7 GHz
ITU-R Recommendation F.497	12.75 – 13.25 GHz
ITU-R Recommendation F.636	14.5 – 15.35 GHz
ITU-R Recommendation F.595 Annex 1	17.7 – 19.7 GHz
ITU-R Recommendation F.637 Annex 1	21.2 – 23.6 GHz
CEPT Recommendation T/R 13-02 Annex A	22 – 22.6 GHz / 23.0 – 23.6 GHz
CEPT Recommendation T/R 13-02 Annex B	24.5 – 26.5 GHz
CEPT/ERC/DECISION (00)09	27.5 – 29.5 GHz
ECC/REC/ (02) 02	31.0 – 31.3 GHz
CEPT/ERC/REC (01)02	31.8 – 33.4 GHz
ITU-R Recommendation F.749 Annex 1	37.0 – 39.5 GHz
CEPT/ERC/REC 12-10	48.5 – 50.2 GHz
CEPT/ERC/REC 12-11	51.4 – 52.6 GHz
CEPT/ERC/REC 12-12	55.78 – 57 GHz
CEPT/ERC/REC 12-09	57 – 59 GHz

2. Proposed Regional footnotes for the SADC Common Allocation Table

SF1 The band 3400 – 3600 MHz is allocated to the Fixed Service for the exclusive use of Fixed Wireless Access applications. Fixed Satellite Service applications shall not be allowed in this band.

SF2 Fixed Wireless Access applications should be assigned frequencies in the band 3600 – 3800 MHz only after exhaustion of the band 3400 – 3600 MHz.

SF3 Coordinated Fixed Satellite Service applications should be assigned frequencies in the band 3600 – 3800 MHz only after exhaustion of the band 3800 – 4200 MHz.

SF4 In the band 3600 – 3800 MHz, fixed wireless access applications, point-to-point fixed links and Fixed Satellite Service applications will operate on coordinated basis. However, considering the potentially large number of VSAT terminals that could be put in operation and the difficulty of coordinating numerous such terminals with equally numerous FWA terminals and base stations, VSAT systems operating in this band should be migrated to the *ku* band to reduce the risk of interference from the FWA into the VSAT systems.

SF5 The band (10.15 – 10.30)/(10.5 – 10.65) GHz is allocated to the Fixed Service for the exclusive use of Fixed Wireless Access applications.

SF6 Agenda item 1.18 of World Radiocommunication Conference 2003 proposes a primary allocation to the Fixed Service in the band 17.3 – 17.7 GHz. If this is approved, this footnote should be deleted, else SADC Member States should propose to be included under footnote 5.514 at World Radiocommunication Conference 2006.

ANNEX 2

EU-footnotes in the European Common Allocation Table

EU1 Within the frequency band 20-108 MHz the common military tuning range is 30-87.5 MHz, however, some equipment types use the lower (20 MHz) and upper (108 MHz) limits, regulated on a national basis. The harmonised military bands are:- 30.30-30.50 MHz; 32.15-32.45 MHz; 41.00-47. 00 MHz; 73.30-74.10 MHz; 79.0-79.70 MHz. When providing for additional requirements, further blocks of frequencies should be spread out over the whole common military tuning range in order to supply frequencies for frequency hopping equipment and to support a larger force (corps size, three divisions). This should be done by the national frequency management organisation(s) concerned.

EU2 Civil-military sharing.

EU3 CEPT administrations are urged to take all practical steps to clear the band 47-68 MHz of assignments to the broadcasting service. The broadcasting assignments according to Stockholm Agreement 1961 shall be protected.

EU4 CEPT administrations are urged to take all practical steps to clear the band 68 - 73 MHz of assignments to the broadcasting service. The broadcasting assignments according to the Final Acts of the Special Regional Conference, Geneva, 1961 shall be protected.

EU5 In parts of this band aeronautical stations and aircraft stations may utilise 8.33 kHz channel spacing for non secure communications requirements.

EU6 The mobile-satellite service is limited to low earth orbiting satellites

EU7 This band can also be used by low capacity fixed links in rural areas on a national basis. These links need to be coordinated with mobile service and require full protection.

EU8 Any use of low capacity fixed links shall be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radiocommunication service.

EU9 This band is included in the Regional Radio Conference planned for 2004/2006 for the revision of the European Broadcasting Agreement, Stockholm 1961.

EU10 The mobile service in the harmonised military band 225 - 400 MHz generally comprises land, air maritime and satellite mobile applications.

EU11 This Meteorological Aids service band shall be subject to further study to ascertain future requirements of this service. The study shall also consider the sharing possibilities between Meteorological Aids service and Short Range Devices(SRDs) and Mobile Satellite Service taking into account the latest developments in the international forum. Possible segmentation of the band shall also be studied.

EU12 The applicable RR S5 footnotes remain in force. Administrations are however urged to aim for the fullest possible harmonisation with the ITU Table of Allocations and ECA.

EU13 CEPT Administrations are urged to take all practical steps to clear the band 645-960 MHz of the assignments to the aeronautical radionavigation service by the year 2008.

EU14 Radiolocation limited to military requirements for naval ship borne radars

EU15 In the frequency band 1350-2690 MHz tactical radio relay systems should be capable of tuning over the full range of this band. Requirements for tactical radio relay should be met from the following sub-bands: 1350–1400 MHz; 1427–1452 MHz; 1492–1525 MHz; 1660–1670 MHz; 1675–1710 MHz; 1785–1800 MHz; 2025–2110 MHz; 2200–2290 MHz; 2520–2575 MHz; 2615–2670 MHz. The common requirement of 2 x 45 MHz for tactical

radio relay for cross/near border operations and exercises should be met from 2025-2110 MHz and 2200-2290 MHz and in particular the bands 2025-2070/2200-2245 MHz.

EU15A Use of the band by the mobile service is limited to tactical radio relay applications

EU16 On the introduction of IMT-2000, the fixed service will become secondary in appropriate parts of the band.

EU16A Use of the band by the mobile service is limited to tactical radio relay and SAP/SAB applications

EU17 In the sub-bands 3400 - 3410 MHz, 5660 - 5670 MHz, 10.36 - 10.37 GHz, 10.45 - 10.46 GHz the amateur service operates on a secondary basis. In making assignments to other services, CEPT administrations are requested wherever possible to maintain these sub-bands in such a way as to facilitate the reception of amateur emissions with minimal power flux densities.

EU17A Use of the band by the mobile service is limited to SAP/SAB applications

EU18 This aeronautical radionavigation band shall be subject to further study to ascertain future requirements and developments.

EU19 This band is allocated to the radio astronomy service. CEPT administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations in this and adjacent bands can cause serious harmful interference.

EU20 This fixed service band is designated for common use by civil and non civil users. Any user priorities in respect of preferred channels or sub-bands are to be determined after discussions between interested parties.

EU21 Not used

EU22 The band 5250 - 5850 MHz is utilised for a variety of radiodetermination applications falling within the radionavigation and radiolocation services. This band will be subject to further detailed consideration.

EU23 In the sub-bands 5660 - 5670 MHz (earth to space), 5830 - 5850 MHz (space to earth) and 10.45 - 10.50 GHz the amateur-satellite additionally operates on a secondary and non interference basis to other services. In making assignments to other services, CEPT administrations are requested wherever possible to maintain these allocations in such a way as to facilitate the reception of amateur emissions with minimal power flux densities.

EU24 The band 8500 - 10000 MHz is utilised for a variety of radiodetermination applications falling within the radionavigation and radiolocation services. This band will be subject to further detailed consideration in conjunction with the band 5250 - 5850 MHz (see EU20).

EU25 Not used.

EU26 The band 13.25 - 14.0 GHz is utilised for a variety of radiodetermination applications falling within the radionavigation and radiolocation services. This band will be subject to further detailed consideration.

EU27 A frequency band that is in general military use in Europe and identified for major military utilisation in the ECA. Such a frequency band forms a basis for military use and planning. The band can be shared between civil and military users according to national requirements and legislation.

EU28 CEPT administrations shall not deploy new fixed service systems in the band 11.7-12.5 GHz (ERC DEC (00) 08).

EU29 The frequency bands 890-915/935-960 MHz, 880-890/925-935 MHz and 1710-1785/1805-1880 MHz are reserved for public cellular mobile use only. Other services such as the fixed service should only be allowed in the above bands where coexistence with public mobile systems is possible i.e. in parsely populated or rural areas where the frequency band is not needed for mobile cellular systems.

EU30 National administrations should consider co-ordination zones around the EISCAT sites when using the band 925-935 MHz for mobile services including international planning for military services. Short Range Devices should not use this band.

EU31 The band 440-470 MHz is the tuning range for Private Wide Area Paging (PWAP)

Annex 3

ITU Radio Regulations footnotes

5.53 Administrations authorizing the use of frequencies below 9 kHz shall ensure that no harmful interference is caused thereby to the services to which the bands above 9 kHz are allocated.

5.54 Administrations conducting scientific research using frequencies below 9 kHz are urged to advise other administrations that may be concerned in order that such research may be afforded all practicable protection from harmful interference.

5.55 Additional allocation: in Armenia, Azerbaijan, Bulgaria, Georgia, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan, the band 14-17 kHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.56 The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakstan, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Russian Federation, Tajikistan, Turkmenistan and Ukraine, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-97)

5.57 The use of the bands 14-19.95 kHz, 20.05-70 kHz and 70-90 kHz (72-84 kHz and 86-90 kHz in Region 1) by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only). Exceptionally, the use of class J2B or J7B emissions is authorized subject to the necessary bandwidth not exceeding that normally used for class A1A or F1B emissions in the band concerned.

5.58 Additional allocation: in Armenia, Azerbaijan, Georgia, Kazakstan, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan, the band 67-70 kHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.59 Different category of service: in Bangladesh and Pakistan, the allocation of the bands 70-72 kHz and 84-86 kHz to the fixed and maritime mobile services is on a primary basis (see No. **5.3**3). (WRC-2000)

5.60 In the bands 70-90 kHz (70-86 kHz in Region 1) and 110-130 kHz (112-130 kHz in Region 1), pulsed radionavigation systems may be used on condition that they do not cause harmful interference to other services to which these bands are allocated.

5.61 In Region 2, the establishment and operation of stations in the maritime radionavigation service in the bands 70-90 kHz and 110-130 kHz shall be subject to agreement obtained under No. **9.21** with administrations whose services, operating in accordance with the Table, may be affected. However, stations of the fixed, maritime mobile and radiolocation services shall not cause harmful interference to stations in the maritime radionavigation service established under such agreements.

5.62 Administrations which operate stations in the radionavigation service in the band 90-110 kHz are urged to coordinate technical and operating characteristics in such a way as to avoid harmful interference to the services provided by these stations.

5.63 (SUP - WRC-97)

5.64 Only classes A1A or F1B, A2C, A3C, F1C or F3C emissions are authorized for stations of the fixed service in the bands allocated to this service between 90 kHz and 160 kHz (148.5 kHz in Region 1) and for stations of the maritime mobile service in the bands allocated to this service between 110 kHz and 160 kHz (148.5 kHz in Region 1). Exceptionally, class J2B or J7B emissions are also authorized in the bands between 110 kHz and 160 kHz (148.5 kHz in Region 1) for stations of the maritime mobile service.

5.65 Different category of service: in Bangladesh, the allocation of the bands 112-117.6 kHz and 126-129 kHz to the fixed and maritime mobile services is on a primary basis (see No. **5.33**). (WRC-2000)

5.66 Different category of service: in Germany, the allocation of the band 115-117.6 kHz to the fixed and maritime mobile services is on a primary basis (see No. **5.33**) and to the radionavigation service on a secondary basis (see No. **5.32**).

5.67 Additional allocation: in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 130-148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate. (WRC-2000)

5.68 Alternative allocation: in Angola, Botswana, Burundi, the Congo, Malawi, Dem. Rep. of the Congo, Rwanda and South Africa, the band 160-200 kHz is allocated to the fixed service on a primary basis.

5.69 Additional allocation: in Somalia, the band 200-255 kHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.70 Alternative allocation: in Angola, Botswana, Burundi, Cameroon, the Central African Rep., the Congo, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Tanzania, Chad, Zambia and Zimbabwe, the band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis.

5.71 Alternative allocation: in Tunisia, the band 255-283.5 kHz is allocated to the broadcasting service on a primary basis.

5.72 Norwegian stations of the fixed service situated in northern areas (north of 60° N) subject to auroral disturbances are allowed to continue operation on four frequencies in the bands 283.5-490 kHz and 510-526.5 kHz.

5.73 The band 285-325 kHz (283.5-325 kHz in Region 1) in the maritime radionavigation service may be used to transmit supplementary navigational information using narrow-band techniques, on condition that no harmful interference is caused to radiobeacon stations operating in the radionavigation service. (WRC-97)

5.74 Additional Allocation: in Region 1, the frequency band 285.3-285.7 kHz is also allocated to the maritime radionavigation service (other than radiobeacons) on a primary basis.

5.75 Different category of service: in Armenia, Azerbaijan, Belarus, Georgia, Moldova, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan, Ukraine and the Black Sea areas of Bulgaria and Romania, the allocation of the band 315-325 kHz to the maritime radionavigation service is on a primary basis under the condition that in the Baltic Sea area, the assignment of frequencies in this band to new stations in the maritime or aeronautical radionavigation services shall be subject to prior consultation between the administrations concerned. (WRC-2000)

5.76 The frequency 410 kHz is designated for radio direction-finding in the maritime radionavigation service. The other radionavigation services to which the band 405-415 kHz is allocated shall not cause harmful interference to radio direction-finding in the band 406.5-413.5 kHz.

5.77 Different category of service: in Australia, China, the French Overseas Territories of Region 3, India, Indonesia (until 1 January 2005), Iran (Islamic Republic of), Japan, Pakistan, Papua New Guinea and Sri Lanka, the allocation of the band 415-495 kHz to the aeronautical radionavigation service is on a primary basis. Administrations in these countries shall take all practical steps necessary to ensure that aeronautical radionavigation stations in the band 435-495 kHz do not cause interference to reception by coast stations of ship stations transmitting on frequencies designated for ship stations on a worldwide basis (see No. **52.39**). (WRC-2000)

5.78 Different category of service: in Cuba, the United States of America and Mexico, the allocation of the band 415-435 kHz to the aeronautical radionavigation service is on a primary basis.

5.79 The use of the bands 415-495 kHz and 505-526.5 kHz (505-510 kHz in Region 2) by the maritime mobile service is limited to radiotelegraphy.

5.79A When establishing coast stations in the NAVTEX service on the frequencies 490 kHz, 518 kHz and 4 209.5 kHz, administrations are strongly recommended to coordinate the operating characteristics in accordance with the procedures of the International Maritime Organization (IMO) (see Resolution **339 (Rev.WRC-97**)). (WRC-97)

5.80 In Region 2, the use of the band 435-495 kHz by the aeronautical radionavigation service is limited to non-directional beacons not employing voice transmission.

5.81 (SUP - WRC-2000)

5.82 In the maritime mobile service, the frequency 490 kHz is, from the date of full implementation of the GMDSS (see Resolution **331 (Rev.WRC-97**)), to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles **31** and **52**. In using the band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz. (WRC-97).

5.83 The frequency 500 kHz is an international distress and calling frequency for Morse radiotelegraphy. The conditions for its use are prescribed in Articles **31** and **52,** and in Appendix **13**.

5.84 The conditions for the use of the frequency 518 kHz by the maritime mobile service are prescribed in Articles **31** and **52** and in Appendix **13**. (WRC-97)

5.85 Not used.

5.86 In Region 2, in the band 525-535 kHz the carrier power of broadcasting stations shall not exceed 1 kW during the day and 250 W at night.

5.87 Additional allocation: in Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the band 526.5-535 kHz is also allocated to the mobile service on a secondary basis.

5.87A Additional allocation: in Uzbekistan, the band 526.5-1 606.5 kHz is also allocated to the radionavigation service on a primary basis. Such use is subject to agreement obtained under No. **9.21** with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime. (WRC-97)

5.88 Additional allocation: in China, the band 526.5-535 kHz is also allocated to the aeronautical radionavigation service on a secondary basis.

5.89 In Region 2, the use of the band 1 605-1 705 kHz by stations of the broadcasting service is subject to the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988). The examination of frequency assignments to stations of the fixed and mobile services in the band 1 625-1 705 kHz shall take account of the allotments appearing in the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

5.90 In the band 1 605-1 705 kHz, in cases where a broadcasting station of Region 2 is concerned, the service area of the maritime mobile stations in Region 1 shall be limited to that provided by ground-wave propagation.

5.91 Additional allocation: in the Philippines and Sri Lanka, the band 1 606.5-1 705 kHz is also allocated to the broadcasting service on a secondary basis. (WRC-97)

5.92 Some countries of Region 1 use radiodetermination systems in the bands 1 606.5-1 625 kHz, 1 635-1 800 kHz, 1 850-2 160 kHz, 2 194-2 300 kHz, 2 502-2 850 kHz and 3 500-3 800 kHz, subject to agreement obtained under No. **9.21**. The radiated mean power of these stations shall not exceed 50 W.

5.93 Additional allocation: in Angola, Armenia, Azerbaijan, Belarus, Georgia, Hungary, Kazakstan,

Latvia, Lithuania, Moldova, Mongolia, Nigeria, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the Russian Federation, Tajikistan, Chad, Turkmenistan and Ukraine, the bands 1 625-1 635 kHz, 1 800-1 810 kHz and 2 160-2 170 kHz and, in Bulgaria, the bands 1 625-1 635 kHz and 1 800-1 810 kHz, are also allocated to the fixed and land mobile services on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-2000)

5.94 and **5.95** Not used.

5.96 In Germany, Armenia, Austria, Azerbaijan, Belarus, Denmark, Estonia, Finland, Georgia, Hungary, Ireland, Israel, Jordan, Kazakstan, Latvia, Liechtenstein, Lithuania, Malta, Moldova, Norway, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the United Kingdom, the Russian Federation, Sweden, Switzerland, Tajikistan, Turkmenistan and Ukraine, administrations may allocate up to 200 kHz to their amateur service in the bands 1 715-1 800 kHz and 1 850-2 000 kHz. However, when allocating the bands within this range to their amateur service, administrations shall, after prior consultation with administrations of neighbouring countries, take such steps as may be necessary to prevent harmful interference from their amateur service to the fixed and mobile services of other countries. The mean power of any amateur station shall not exceed 10 W. (WRC-2000).

5.97 In Region 3, the Loran system operates either on 1 850 kHz or 1 950 kHz, the bands occupied being 1 825-1 875 kHz and 1 925-1 975 kHz respectively. Other services to which the band 1 800-2 000 kHz is allocated may use any frequency therein on condition that no harmful interference is caused to the Loran system operating on 1 850 kHz or 1 950 kHz.

5.98 Alternative allocation: in Angola, Armenia, Azerbaijan, Belarus, Belgium, Bulgaria, Cameroon, the Congo, Denmark, Egypt, Eritrea, Spain, Ethiopia, Georgia, Greece, Italy, Kazakstan, Lebanon, Lithuania, Moldova, the Netherlands, Syria, Kyrgyzstan, the Russian Federation, Somalia, Tajikistan, Tunisia, Turkmenistan, Turkey and Ukraine, the band 1 810-1 830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-2000)

5.99 Additional allocation: in Saudi Arabia, Austria, Bosnia and Herzegovina, Iraq, Libya, Uzbekistan, Slovakia, the Czech Rep., Romania, Slovenia, Chad, Togo and Yugoslavia, the band 1 810-1 830 kHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-2000)

5.100 In Region 1, the authorization to use the band 1 810-1 830 kHz by the amateur service in countries situated totally or partially north of 40° N shall be given only after consultation with the countries mentioned in Nos. **5.98** and **5.99** to define the necessary steps to be taken to prevent harmful interference between amateur stations and stations of other services operating in accordance with Nos. **5.98** and **5.99**.

5.101 Alternative allocation: in Burundi and Lesotho, the band 1 810-1 850 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.102 Alternative allocation: in Argentina, Bolivia, Chile, Mexico, Paraguay, Peru, Uruguay and Venezuela, the band 1 850-2 000 kHz is allocated to the fixed, mobile except aeronautical mobile, radiolocation and radionavigation services on a primary basis.

5.103 In Region 1, in making assignments to stations in the fixed and mobile services in the bands 1 850-2 045 kHz, 2 194-2 498 kHz, 2 502-2 625 kHz and 2 650-2 850 kHz, administrations should bear in mind the special requirements of the maritime mobile service.

5.104 In Region 1, the use of the band 2 025-2 045 kHz by the meteorological aids service is limited to oceanographic buoy stations.

5.105 In Region 2, except in Greenland, coast stations and ship stations using radiotelephony in the band 2 065-2 107 kHz shall be limited to class J3E emissions and to a peak envelope power not exceeding 1 kW. Preferably, the following carrier frequencies should be used: 2 065.0 kHz, 2 079.0 kHz, 2 082.5 kHz, 2 086.0 kHz, 2 093.0 kHz, 2 096.5 kHz, 2 100.0 kHz and 2 103.5 kHz. In Argentina and Uruguay, the carrier frequencies 2 068.5 kHz and 2 075.5 kHz are also used for this purpose, while the frequencies within the band 2 072-2 075.5 kHz are used as provided in No. **52.165**.

5.106 In Regions 2 and 3, provided no harmful interference is caused to the maritime mobile service, the frequencies between 2 065 kHz and 2 107 kHz may be used by stations of the fixed service communicating only within national borders and whose mean power does not exceed 50 W. In notifying the frequencies, the attention of the Bureau should be drawn to these provisions.

5.107 Additional allocation: in Saudi Arabia, Botswana, Eritrea, Ethiopia, Iraq, Lesotho, Libya, Somalia and Swaziland, the band 2 160-2 170 kHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. The mean power of stations in these services shall not exceed 50 W. (WRC-2000)

5.108 The carrier frequency 2 182 kHz is an international distress and calling frequency for radiotelephony. The conditions for the use of the band 2 173.5-2 190.5 kHz are prescribed in Articles **31** and **52** and in Appendix **13**.

5.109 The frequencies 2 187.5 kHz, 4 207.5 kHz, 6 312 kHz, 8 414.5 kHz, 12 577 kHz and 16 804.5 kHz are international distress frequencies for digital selective calling. The conditions for the use of these frequencies are prescribed in Article **31**.

5.110 The frequencies 2 174.5 kHz, 4 177.5 kHz, 6 268 kHz, 8 376.5 kHz, 12 520 kHz and 16 695 kHz are international distress frequencies for narrow-band direct-printing telegraphy. The conditions for the use of these frequencies are prescribed in Article **31**.

5.111 The carrier frequencies 2 182 kHz, 3 023 kHz, 5 680 kHz, 8 364 kHz and the frequencies 121.5 MHz, 156.8 MHz and 243 MHz may also be used, in accordance with the procedures in force for terrestrial radiocom-munication services, for search and rescue operations concerning manned space vehicles. The conditions for the use of the frequencies are prescribed in Article **31** and in Appendix **13**. The same applies to the frequencies 10 003 kHz, 14 993 kHz and 19 993 kHz, but in each of these cases emissions must be confined in a band of □3 kHz about the frequency.

5.112 Alternative allocation: in Bosnia and Herzegovina, Cyprus, Denmark, Greece, Iceland, Malta, Sri Lanka and Yugoslavia, the band 2 194-2 300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-2000)

5.113 For the conditions for the use of the bands 2 300-2 495 kHz (2 498 kHz in Region 1), 3 200-3 400 kHz, 4 750-4 995 kHz and 5 005-5 060 kHz by the broadcasting service, see Nos. **5.16** to **5.20**, **5.21** and **23.3** to **23.10**.

5.114 Alternative allocation: in Bosnia and Herzegovina, Cyprus, Denmark, Greece, Iraq, Malta, and Yugoslavia, the band 2 502-2 625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-2000)

5.115 The carrier (reference) frequencies 3 023 kHz and 5 680 kHz may also be used, in accordance with Article **31** and Appendix **13** by stations of the maritime mobile service engaged in coordinated search and rescue operations.

5.116 Administrations are urged to authorize the use of the band 3 155-3 195 kHz to provide a common worldwide channel for low power wireless hearing aids. Additional channels for these devices may be assigned by administrations in the bands between 3 155 kHz and 3 400 kHz to suit local needs. It should be noted that frequencies in the range 3 000 kHz to 4 000 kHz are suitable for hearing aid devices which are designed to operate over short distances within the induction field.

5.117 Alternative allocation: in Bosnia and Herzegovina, Cyprus, Côte d'Ivoire, Denmark, Egypt, Greece, Iceland, Liberia, Malta, Sri Lanka, Togo and Yugoslavia, the band 3 155-3 200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-2000).

5.118 Additional allocation: in the United States, Japan, Mexico, Peru and Uruguay, the band 3 230-3 400 kHz is also allocated to the radiolocation service on a secondary basis.

5.119 Additional allocation: in Honduras, Mexico, Peru and Venezuela, the band 3 500-3 750 kHz is also allocated to the fixed and mobile services on a primary basis.

5.120 (SUP - WRC-2000)

5.121 Not used.

5.122 Alternative allocation: in Argentina, Bolivia, Chile, Ecuador, Paraguay, Peru and Uruguay, the band 3 750-4 000 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.123 Additional allocation: in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the band 3 900-3 950 kHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**.

5.124 (SUP - WRC-2000)

5.125 Additional allocation: in Greenland, the band 3 950-4 000 kHz is also allocated to the broadcasting service on a primary basis. The power of the broadcasting stations operating in this band shall not exceed that necessary for a national service and shall in no case exceed 5 kW.

5.126 In Region 3, the stations of those services to which the band 3 995-4 005 kHz is allocated may transmit standard frequency and time signals.

5.127 The use of the band 4 000-4 063 kHz by the maritime mobile service is limited to ship stations using radiotelephony (see No. **52.220** and Appendix **17**).

5.128 In Afghanistan, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Burkina Faso, the Central African Rep., China, Georgia, India, Kazakstan, Mali, Niger, Kyrgyzstan, Russian Federation, Tajikistan, Chad, Turkmenistan and Ukraine, in the bands 4 063-4 123 kHz, 4 130-4 133 kHz and 4 408-4 438 kHz, stations of limited power in the fixed service which are situated at least 600 km from the coast may operate on condition that harmful interference is not caused to the maritime mobile service. (WRC-97)

5.129 On condition that harmful interference is not caused to the maritime mobile service, the frequencies in the bands 4 063-4 123 kHz and 4 130-4 438 kHz may be used exceptionally by stations in the fixed service communicating only within the boundary of the country in which they are located with a mean power not exceeding 50 W.

5.130 The conditions for the use of the carrier frequencies 4 125 kHz and 6 215 kHz are prescribed in Articles **31** and **52** and in Appendix **13**.

5.131 The frequency 4 209.5 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing techniques. (WRC-97)

5.132 The frequencies 4 210 kHz, 6 314 kHz, 8 416.5 kHz, 12 579 kHz, 16 806.5 kHz, 19 680.5 kHz, 22 376 kHz and 26 100.5 kHz are the international frequencies for the transmission of maritime safety information (MSI) (see Appendix **17**).

5.133 Different category of service: in Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Uzbekistan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 5 130-5 250 kHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**).

5.134 The use of the bands 5 900-5 950 kHz, 7 300-7 350 kHz, 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 13 570-13 600 kHz, 13 800-13 870 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz by the broadcasting service is limited to single-sideband emissions with the characteristics specified in Appendix **11** or to any other spectrum-efficient modulation techniques recommended by ITU-R. Access to these bands shall be subject to the decisions of a competent conference. (WRC-97)

5.135 (SUP - WRC-97)

5.136 The band 5 900-5 950 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, as well as to the following services: in Region 1 to the land mobile service on a primary basis, in Region 2 to the mobile except aeronautical mobile (R) service on a primary basis, and in Region 3 to the mobile except aeronautical mobile (R) service on a secondary basis, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95**). After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.137 On condition that harmful interference is not caused to the maritime mobile service, the bands 6 200-6 213.5 kHz and 6 220.5-6 525 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W. At the time of notification of these frequencies, the attention of the Bureau will be drawn to the above conditions.

5.138 The following bands:

6 765-6 795 kHz	(centre frequency 6 780 kHz),
433.05-434.79 MHz	(centre frequency 433.92 MHz) in Region 1 except in the countries mentioned in No. **5.280**,
61-61.5 GHz	(centre frequency 61.25 GHz),
122-123 GHz	(centre frequency 122.5 GHz), and
244-246 GHz	(centre frequency 245 GHz)

are designated for industrial, scientific and medical (ISM) applications. The use of these frequency bands for ISM applications shall be subject to special authorization by the administration concerned, in agreement with other administrations whose radiocommunication services might be affected. In applying this provision, administrations shall have due regard to the latest relevant ITU-R Recommendations.

5.139 Different category of service: in Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 6 765-7 000 kHz to the land mobile service is on a primary basis (see No. **5.3**3).

5.140 Additional allocation: in Angola, Iraq, Rwanda, Somalia and Togo, the band 7 000-7 050 kHz is also allocated to the fixed service on a primary basis.

5.141 Alternative allocation: in Egypt, Eritrea, Ethiopia, Guinea, Libya and Madagascar, the band 7 000-7 050 kHz is allocated to the fixed service on a primary basis. (WRC-97).

5.142 The use of the band 7 100-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

5.143 The band 7 300-7 350 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis and to the land mobile service on a secondary basis, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95**). After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.144 In Region 3, the stations of those services to which the band 7 995-8 005 kHz is allocated may transmit standard frequency and time signals.

5.145 The conditions for the use of the carrier frequencies 8 291 kHz, 12 290 kHz and 16 420 kHz are

prescribed in Articles **31** and **52** and in Appendix **13**.
5.146 The bands 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz are allocated to the fixed service on a primary basis until 1 April 2007, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95**). After 1 April 2007, frequencies in these bands may be used by stations in the fixed service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies in the fixed service, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.147 On condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9 775-9 900 kHz, 11 650-11 700 kHz and 11 975-12 050 kHz may be used by stations in the fixed service communicating only within the boundary of the country in which they are located, each station using a total radiated power not exceeding 24 dBW.

5.148 (SUP - WRC-97).

5.149 In making assignments to stations of other services to which the bands:
13 360-13 410 kHz,
25 550-25 670 kHz,
37.5-38.25 MHz,
73-74.6 MHz in Regions 1 and 3,
150.05-153 MHz in Region 1,
322-328.6 MHz,
406.1-410 MHz,
608-614 MHz in Regions 1 and 3,
1 330-1 400 MHz,
1 610.6-1 613.8 MHz,
1 660-1 670 MHz,
1 718.8-1 722.2 MHz,
2 655-2 690 MHz,
3 260-3 267 MHz,
3 332-3 339 MHz,
3 345.8-3 352.5 MHz,
4 825-4 835 MHz,
4 950-4 990 MHz,
4 990-5 000 MHz,
6 650-6 675.2 MHz,
10.6-10.68 GHz,
14.47-14.5 GHz,
22.01-22.21 GHz,
22.21-22.5 GHz,
22.81-22.86 GHz,
23.07-23.12 GHz,
31.2-31.3 GHz,
31.5-31.8 GHz in Regions 1 and 3,
36.43-36.5 GHz,
42.5-43.5 GHz,
42.77-42.87 GHz,
43.07-43.17 GHz,
43.37-43.47 GHz,
48.94-49.04 GHz,
76-86 GHz,
92-94 GHz,
94.1-100 GHz,
102-109.5 GHz,
111.8-114.25 GHz,
128.33-128.59 GHz,
129.23-129.49 GHz,
130-134 GHz,

136-148.5 GHz,
151.5-158.5 GHz,
168.59-168.93 GHz,
171.11-171.45 GHz,
172.31-172.65 GHz,
173.52-173.85 GHz,
195.75-196.15 GHz,
209-226 GHz,
241-250 GHz,
252-275 GHz

are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. **4.5** and **4.6** and Article **29**). (WRC-2000)

5.150 The following bands:
13 553-13 567 kHz (centre frequency 13 560 kHz),
26 957-27 283 kHz (centre frequency 27 120 kHz),
40.66-40.70 MHz (centre frequency 40.68 MHz),
902-928 MHz in Region 2 (centre frequency 915 MHz),
2 400-2 500 MHz (centre frequency 2 450 MHz),
5 725-5 875 MHz (centre frequency 5 800 MHz), and
24-24.25 GHz (centre frequency 24.125 GHz)

are also designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within these bands must accept harmful interference which may be caused by these applications. ISM equipment operating in these bands is subject to the provisions of No. **15.13**.

5.151 The bands 13 570-13 600 kHz and 13 800-13 870 kHz are allocated, until 1 April 2007, to the fixed service on a primary basis and to the mobile except aeronautical mobile (R) service on a secondary basis, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95**). After 1 April 2007, frequencies in these bands may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies in these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.152 Additional allocation: in Armenia, Azerbaijan, China, Côte d'Ivoire, Georgia, Iran (Islamic Republic of), Kazakstan, Moldova, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 14 250-14 350 kHz is also allocated to the fixed service on a primary basis. Stations of the fixed service shall not use a radiated power exceeding 24 dBW. (WRC-2000)

5.153 In Region 3, the stations of those services to which the band 15 995-16 005 kHz is allocated may transmit standard frequency and time signals.

5.154 Additional allocation: in Armenia, Azerbaijan, Georgia, Kazakstan, Moldova, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 18 068-18 168 kHz is also allocated to the fixed service on a primary basis for use within their boundaries, with a peak envelope power not exceeding 1 kW. (WRC-2000)

5.155 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Hungary, Kazakstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 21 850-21 870 kHz is also allocated to the aeronautical mobile (R) services on a primary basis.

5.155A In Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the use of the band 21 850-21 870 kHz by the fixed service is limited to provision of services related to aircraft flight safety. (WRC-2000)

5.155B The band 21 870-21 924 kHz is used by the fixed service for provision of services related to aircraft flight safety.

5.156 Additional allocation: in Nigeria, the band 22 720-23 200 kHz is also allocated to the meteorological aids service (radiosondes) on a primary basis.

5.156A The use of the band 23 200-23 350 kHz by the fixed service is limited to provision of services related to aircraft flight safety.

5.157 The use of the band 23 350-24 000 kHz by the maritime mobile service is limited to inter-ship radiotelegraphy.

5.158 and **5.159** Not used.

5.160 Additional allocation: in Botswana, Burundi, Lesotho, Malawi, Dem. Rep. of the Congo, Rwanda and Swaziland, the band 41-44 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-2000)

5.161 Additional allocation: in Iran (Islamic Republic of) and Japan, the band 41-44 MHz is also allocated to the radiolocation service on a secondary basis.

5.162 Additional allocation: in Australia and New Zealand, the band 44-47 MHz is also allocated to the broadcasting service on a primary basis.

5.162A Additional allocation: in Germany, Austria, Belgium, Bosnia and Herzegovina, China, Vatican, Denmark, Spain, Estonia, Finland, France, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Luxembourg, Moldova, Monaco, Norway, the Netherlands, Poland, Portugal, Slovakia, the Czech Rep., the United Kingdom, the Russian Federation, Sweden and Switzerland the band 46-68 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97**). (WRC-2000).

5.163 Additional allocation: in Armenia, Azerbaijan, Belarus, Estonia, Georgia, Hungary, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Russian Federation, Tajikistan, Turkmenistan and Ukraine, the bands 47-48.5 MHz and 56.5-58 MHz are also allocated to the fixed and land mobile services on a secondary basis.

5.164 Additional allocation: in Albania, Germany, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Côte d'Ivoire, Denmark, Spain, Finland, France, Gabon, Greece, Ireland, Israel, Italy, Jordan, Lebanon, Libya, Liechtenstein, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Nigeria, Norway, the Netherlands, Poland, Syria, the United Kingdom, Senegal, Slovenia, Sweden, Switzerland, Swaziland, Togo, Tunisia, Turkey and Yugoslavia the band 47-68 MHz, in Romania the band 47-58 MHz and in the Czech Rep. The band 66-68 MHz, are also allocated to the land mobile service on a primary basis. However, stations of the land mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations of countries other than those mentioned in connection with the band. (WRC-97)

5.165 Additional allocation: in Angola, Cameroon, the Congo, Madagascar, Mozambique, Somalia, Sudan, Tanzania and Chad, the band 47-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.166 Alternative allocation: in New Zealand, the band 50-51 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis; the band 53-54 MHz is allocated to the fixed and mobile services on a primary basis.

5.167 Alternative allocation: in Bangladesh, Brunei Darussalam, India, Indonesia, Iran (Islamic Republic of), Malaysia, Pakistan, Singapore and Thailand, the band 50-54 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis.

5.168 Additional allocation: in Australia, China and the Dem. People's Rep. of Korea, the band 50-54 MHz is also allocated to the broadcasting service on a primary basis.

5.169 Alternative allocation: in Botswana, Burundi, Lesotho, Malawi, Namibia, Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Zambia and Zimbabwe, the band 50-54 MHz is allocated to the amateur service on a primary basis.

5.170 Additional allocation: in New Zealand, the band 51-53 MHz is also allocated to the fixed and mobile services on a primary basis.

5.171 Additional allocation: in Botswana, Burundi, Lesotho, Malawi, Mali, Namibia, Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland and Zimbabwe, the band 54-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.172 Different category of service: in the French Overseas Departments in Region 2, Guyana, Jamaica and Mexico, the allocation of the band 54-68 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

5.173 Different category of service: in the French Overseas Departments in Region 2, Guyana, Jamaica and Mexico, the allocation of the band 68-72 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

5.174 Alternative allocation: in Bulgaria, Hungary, Poland and Romania, the band 68-73 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions in the Final Acts of the Special Regional Conference (Geneva, 1960). (WRC-97)

5.175 Alternative allocation: in Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the bands 68-73 MHz and 76-87.5 MHz are allocated to the broadcasting service on a primary basis. The services to which these bands are allocated in other countries and the broadcasting service in the countries listed above are subject to agreements with the neighbouring countries concerned. (WRC-2000)

5.176 Additional allocation: in Australia, China, Korea (Rep. of), Estonia (subject to agreement obtained under No. **9.2**1), the Philippines, the Dem. People's Rep. of Korea and Samoa, the band 68-74 MHz is also allocated to the broadcasting service on a primary basis. (WRC-2000).

5.177 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakstan, Latvia, Moldova, Uzbekistan, Poland, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 73-74 MHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-2000)

5.178 Additional allocation: in Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Guyana, Honduras and Nicaragua, the band 73-74.6 MHz is also allocated to the fixed and mobile services on a secondary basis.

5.179 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, China, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Russian Federation, Tajikistan, Turkmenistan and Ukraine, the bands 74.6-74.8 MHz and 75.2-75.4 MHz are also allocated to the aeronautical radionavigation service, on a primary basis, for ground-based transmitters only.

5.180 The frequency 75 MHz is assigned to marker beacons. Administrations shall refrain from assigning frequencies close to the limits of the guardband to stations of other services which, because of their power or geographical position, might cause harmful interference or otherwise place a constraint on marker beacons. Every effort should be made to improve further the characteristics of airborne receivers and to limit the power of transmitting stations close to the limits 74.8 MHz and 75.2 MHz.

5.181 Additional allocation: in Egypt, Israel, Japan, and Syria, the band 74.8-75.2 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.2**1. In order to

ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **9.21**. (WRC-2000).

5.182 Additional allocation: in Western Samoa, the band 75.4-87 MHz is also allocated to the broadcasting service on a primary basis.

5.183 Additional allocation: in China, Korea (Rep. of), Japan, the Philippines and the Dem. People's Rep. of Korea, the band 76-87 MHz is also allocated to the broadcasting service on a primary basis.

5.184 Additional allocation: in Bulgaria and Romania, the band 76-87.5 MHz is also allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference (Geneva, 1960). (WRC-97)

5.185 Different category of service: in the United States, the French Overseas Departments in Region 2, Guyana, Jamaica, Mexico and Paraguay, the allocation of the band 76-88 MHz to the fixed and mobile services is on a primary basis (see No. **5.3**3).

5.186 (SUP - WRC-97)

5.187 Alternative allocation: in Albania, the band 81-87.5 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference (Geneva, 1960).

5.188 Additional allocation: in Australia, the band 85-87 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service in Australia is subject to special agreements between the administrations concerned.

5.189 Not used.

5.190 Additional allocation: in Monaco, the band 87.5-88 MHz is also allocated to the land mobile service on a primary basis, subject to agreement obtained under No. **9.2**1. (WRC-97)

5.191 Not used.

5.192 Additional allocation: in China and Korea (Rep. of), the band 100-108 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-97)

5.193 Not used.

5.194 Additional allocation: in Azerbaijan, Lebanon, Syria, Kyrgyzstan, Somalia and Turkmenistan, the band 104-108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a secondary basis. (WRC-97)

5.195 and **5.196** Not used.

5.197 Additional allocation: in Japan, Pakistan and Syria, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **9.21**. (WRC-2000)

5.198 Additional allocation: the band 117.975-136 MHz is also allocated to the aeronautical mobile-satellite (R) service on a secondary basis, subject to agreement obtained under No. **9.21**. (WRC-97)

5.199 The bands 121.45-121.55 MHz and 242.95-243.05 MHz are also allocated to the mobile-satellite service for the reception on board satellites of emissions from emergency position-indicating radiobeacons transmitting at 121.5 MHz and 243 MHz (see Appendix **13**).

5.200 In the band 117.975-136 MHz, the frequency 121.5 MHz is the aeronautical emergency frequency and, where required, the frequency 123.1 MHz is the aeronautical frequency auxiliary to 121.5 MHz. Mobile stations of the maritime mobile service may communicate on these frequencies under the conditions laid down in Article **31** and Appendix **13** for distress and safety purposes with stations of the aeronautical mobile service.

5.201 Additional allocation: in Angola, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Japan, Kazakstan, Latvia, Moldova, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 132-136 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-97)

5.202 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Jordan, Latvia, Moldova, Oman, Uzbekistan, Poland, Syria, Kyrgyzstan, Slovakia, the Czech Rep., Romania, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 136-137 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-2000)

5.203 In the band 136-137 MHz, existing operational meteorological satellites may continue to operate, under the conditions defined in No. **4.4** with respect to the aeronautical mobile service, until 1 January 2002. Administrations shall not authorize new frequency assignments in this band to stations in the meteorological-satellite service. (WRC-97)

5.203A Additional allocation: in Israel, Mauritania, Qatar and Zimbabwe, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a secondary basis until 1 January 2005. (WRC-97)

5.203B Additional allocation: in Saudi Arabia, United Arab Emirates, Jordan, Oman and Syria, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis until 1 January 2005. (WRC-97)

5.204 Different category of service: in Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, China, Cuba, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Malaysia, Oman, Pakistan, Philippines, Qatar, Singapore, Sri Lanka, Thailand, Yemen and Yugoslavia, the band 137-138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. **5.33**).

5.205 Different category of service: in Israel and Jordan, the allocation of the band 137-138 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**).

5.206 Different category of service: in Armenia, Azerbaijan, Belarus, Bulgaria, Egypt, Finland, France, Georgia, Greece, Kazakstan, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Syria, Slovakia, the Czech Rep., Romania, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 137-138 MHz to the aeronautical mobile (OR) service is on a primary basis (see No. **5.33**). (WRC-2000)

5.207 Additional allocation: in Australia, the band 137-144 MHz is also allocated to the broadcasting service on a primary basis until that service can be accommodated within regional broadcasting allocations.

5.208 The use of the band 137-138 MHz by the mobile-satellite service is subject to coordination under No. **9.11**A. (WRC-97)

5.208A In making assignments to space stations in the mobile-satellite service in the bands 137-138 MHz, 387-390 MHz and 400.15-401 MHz, administrations shall take all practicable steps to protect the

radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions. The threshold levels of interference detrimental to the radio astronomy service are shown in Table 1 of Recommendation ITU-R RA.769-1. (WRC-97)

5.209 The use of the bands 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, 400.15-401 MHz, 454-456 MHz and 459-460 MHz by the mobile-satellite service is limited to non-geostationary-satellite systems. (WRC-97).

5.210 Additional allocation: in France, Italy, Liechtenstein, Slovakia, the Czech Rep., the United Kingdom and Switzerland, the bands 138-143.6 MHz and 143.65-144 MHz are also allocated to the space research service (space-to-Earth) on a secondary basis. (WRC-2000)

5.211 Additional allocation: in Germany, Saudi Arabia, Austria, Bahrain, Belgium, Bosnia and Herzegovina, Denmark, the United Arab Emirates, Spain, Finland, Greece, Ireland, Israel, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Liechtenstein, Luxembourg, Mali, Malta, Norway, the Netherlands, Qatar, the United Kingdom, Somalia, Sweden, Switzerland, Tanzania, Tunisia, Turkey and Yugoslavia, the band 138-144 MHz is also allocated to the maritime mobile and land mobile services on a primary basis. (WRC-2000)

5.212 Alternative allocation: in Angola, Botswana, Burundi, Cameroon, the Central African Rep., the Congo, Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Lesotho, Liberia, Libya, Malawi, Mozambique, Namibia, Nigeria, Oman, Dem. Rep. of the Congo, Rwanda, Sierra Leone, South Africa, Swaziland, Chad, Togo, Zambia and Zimbabwe, the band 138-144 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-2000)

5.213 Additional allocation: in China, the band 138-144 MHz is also allocated to the radiolocation service on a primary basis.

5.214 Additional allocation: in Bosnia and Herzegovina, Croatia, Eritrea, Ethiopia, Kenya, The Former Yugoslav Republic of Macedonia, Malta, Somalia, Sudan, Tanzania and Yugoslavia, the band 138-144 MHz is also allocated to the fixed service on a primary basis. (WRC-2000)

5.215 Not used.

5.216 Additional allocation: in China, the band 144-146 MHz is also allocated to the aeronautical mobile (OR) service on a secondary basis.

5.217 Alternative allocation: in Afghanistan, Bangladesh, Cuba, Guyana and India, the band 146-148 MHz is allocated to the fixed and mobile services on a primary basis.

5.218 Additional allocation: the band 148-149.9 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **9.21**. The bandwidth of any individual transmission shall not exceed ± 25 kHz.

5.219 The use of the band 148-149.9 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The mobile-satellite service shall not constrain the development and use of the fixed, mobile and space operation services in the band 148-149.9 MHz.

5.220 The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz. (WRC-97)

5.221 Stations of the mobile-satellite service in the band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo, Korea (Rep. of), Croatia, Cuba, Denmark, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland,

Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakstan, Kenya, Kuwait, Latvia, The Former Yugoslav Republic of Macedonia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, Syria, Kyrgyzstan, Slovakia, Romania, the United Kingdom, the Russian Federation, Senegal, Sierra Leone, Singapore, Slovenia, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Yugoslavia, Zambia, and Zimbabwe. (WRC-2000)

5.222 Emissions of the radionavigation-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz may also be used by receiving earth stations of the space research service.

5.223 Recognizing that the use of the band 149.9-150.05 MHz by the fixed and mobile services may cause harmful interference to the radionavigation-satellite service, administrations are urged not to authorize such use in application of No. **4.4**.

5.224 (SUP - WRC-97)

5.224A The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to the land mobile-satellite service (Earth-to-space) until 1 January 2015. (WRC-97)

5.224B The allocation of the bands 149.9-150.05 MHz and 399.9-400.05 MHz to the radionavigation-satellite service shall be effective until 1 January 2015. (WRC-97)

5.225 Additional allocation: in Australia and India, the band 150.05-153 MHz is also allocated to the radio astronomy service on a primary basis.

5.226 The frequency 156.8 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service. The conditions for the use of this frequency are contained in Article **31** and Appendix **13**. In the bands 156-156.7625 MHz, 156.8375-157.45 MHz, 160.6-160.975 MHz and 161.475-162.05 MHz, each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by the administration (see Articles **31** and **52**, and Appendix **13**). Any use of frequencies in these bands by stations of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radio-communication service. However, the frequency 156.8 MHz and the frequency bands in which priority is given to the maritime mobile service may be used for radiocommunications on inland waterways subject to agreement between interested and affected administrations and taking into account current frequency usage and existing agreements.

5.227 In the maritime mobile VHF service the frequency 156.525 MHz is to be used exclusively for digital selective calling for distress, safety and calling. The conditions for the use of this frequency are prescribed in Articles **31** and **52**, and Appendices **13** and **18**.

5.228 Not used.

5.229 Alternative allocation: in Morocco, the band 162-174 MHz is allocated to the broadcasting service on a primary basis. The use of this band shall be subject to agreement with administrations having services, operating or planned, in accordance with the Table which are likely to be affected. Stations in existence on 1 January 1981, with their technical characteristics as of that date, are not affected by such agreement.

5.230 Additional allocation: in China, the band 163-167 MHz is also allocated to the space operation service (space-to-Earth) on a primary basis, subject to agreement obtained under No. **9.21**.

5.231 Additional allocation: in Afghanistan, China and Pakistan, the band 167-174 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service into this band shall be subject to agreement with the neighbouring countries in Region 3 whose services are likely to be affected.

5.232 Additional allocation: in Japan, the band 170-174 MHz is also allocated to the broadcasting service on a primary basis.

5.233 Additional allocation: in China, the band 174-184 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis, subject to agreement obtained under No. **9.21**. These services shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations.

5.234 Different category of service: in Mexico, the allocation of the band 174-216 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

5.235 Additional allocation: in Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Malta, Monaco, Norway, the Netherlands, the United Kingdom, Sweden and Switzerland, the band 174-223 MHz is also allocated to the land mobile service on a primary basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

5.236 Not used.

5.237 Additional allocation: in the Congo, Eritrea, Ethiopia, Gambia, Guinea, Libya, Malawi, Mali, Senegal, Sierra Leone, Somalia, Tanzania and Zimbabwe, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-97)

5.238 Additional allocation: in Bangladesh, India, Pakistan and the Philippines, the band 200-216 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.239 Not used.

5.240 Additional allocation: in China and India, the band 216-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

5.241 In Region 2, no new stations in the radiolocation service may be authorized in the band 216-225 MHz. Stations authorized prior to 1 January 1990 may continue to operate on a secondary basis.

5.242 Additional allocation: in Canada, the band 216-220 MHz is also allocated to the land mobile service on a primary basis.

5.243 Additional allocation: in Somalia, the band 216-225 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to not causing harmful interference to existing or planned broadcasting services in other countries.

5.244 (SUP - WRC-97)

5.245 Additional allocation: in Japan, the band 222-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

5.246 Alternative allocation: in Spain, France, Israel and Monaco, the band 223-230 MHz is allocated to the broadcasting and land mobile services on a primary basis (see No. **5.33**) on the basis that, in the preparation of frequency plans, the broadcasting service shall have prior choice of frequencies; and allocated to the fixed and mobile, except land mobile, services on a secondary basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations in Morocco and Algeria.

5.247 Additional allocation: in Saudi Arabia, Bahrain, the United Arab Emirates, Jordan, Oman, Qatar and Syria, the band 223-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.248 and **5.249** Not used.

5.250 Additional allocation: in China, the band 225-235 MHz is also allocated to the radio astronomy service on a secondary basis.

5.251 Additional allocation: in Nigeria, the band 230-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to agreement obtained under No. **9.21**.

5.252 Alternative allocation: in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the bands 230-238 MHz and 246-254 MHz are allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**.

5.253 Not used.

5.254 The bands 235-322 MHz and 335.4-399.9 MHz may be used by the mobile-satellite service, subject to agreement obtained under No. **9.21**, on condition that stations in this service do not cause harmful interference to those of other services operating or planned to be operated in accordance with the Table of Frequency Allocations.

5.255 The bands 312-315 MHz (Earth-to-space) and 387-390 MHz (space-to-Earth) in the mobile-satellite service may also be used by non-geostationary-satellite systems. Such use is subject to coordination under No. **9.11A**.

5.256 The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes (see Appendix **13**).

5.257 The band 267-272 MHz may be used by administrations for space telemetry in their countries on a primary basis, subject to agreement obtained under No. **9.21**.

5.258 The use of the band 328.6-335.4 MHz by the aeronautical radionavigation service is limited to Instrument Landing Systems (glide path).

5.259 Additional allocation: in Egypt, Israel, Japan, and Syria, the band 328.6-335.4 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **9.21**. (WRC-2000).

5.260 Recognizing that the use of the band 399.9-400.05 MHz by the fixed and mobile services may cause harmful interference to the radionavigation satellite service, administrations are urged not to authorize such use in application of No. **4.4**.

5.261 Emissions shall be confined in a band of ± 25 kHz about the standard frequency 400.1 MHz.

5.262 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Bulgaria, Colombia, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakstan, Kuwait, Liberia, Malaysia, Moldova, Nigeria, Uzbekistan, Pakistan, the Philippines, Qatar, Syria, Kyrgyzstan, Slovakia, Romania, the Russian Federation, Singapore, Somalia, Tajikistan, Turkmenistan, Ukraine and Yugoslavia, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-2000)

5.263 The band 400.15-401 MHz is also allocated to the space research service in the space-to-space direction for communications with manned space vehicles. In this application, the space research service will not be regarded as a safety service.

5.264 The use of the band 400.15-401 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The power flux-density limit indicated in Annex 1 of Appendix **5** shall apply until such time as a competent world radiocommunication conference revises it.

5.265 Not used.

5.266 The use of the band 406-406.1 MHz by the mobile-satellite service is limited to low power satellite emergency position-indicating radiobeacons (see also Article **31** and Appendix **13**).

5.267 Any emission capable of causing harmful interference to the authorized uses of the band 406-406.1 MHz is prohibited.

5.268 Use of the band 410-420 MHz by the space research service is limited to communications within 5 km of an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from extra-vehicular activities shall not exceed –153 dB(W/m^2) for $0° \leq \delta \leq 5°$, $-153 + 0.077(\delta - 5)$ dB(W/m^2) for $5° \leq \delta \leq 70°$ and –148 dB(W/m^2) for $70° \leq \delta \leq 90°$, where δ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. No. **4.10** does not apply to extra-vehicular activities. In this frequency band the space research (space-to-space) service shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services. (WRC-97)

5.269 Different category of service: in Australia, the United States, India, Japan and the United Kingdom, the allocation of the bands 420-430 MHz and 440-450 MHz to the radiolocation service is on a primary basis (see No. **5.33**).

5.270 Additional allocation: in Australia, the United States, Jamaica and the Philippines, the bands 420-430 MHz and 440-450 MHz are also allocated to the amateur service on a secondary basis.

5.271 Additional allocation: in Azerbaijan, Belarus, China, Estonia, India, Latvia, Lithuania, Kyrgyzstan and Turkmenistan, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis. (WRC-2000)

5.272 Different category of service: in France, the allocation of the band 430-434 MHz to the amateur service is on a secondary basis (see No. **5.32**).

5.273 Different category of service: in Denmark, Libya and Norway, the allocation of the bands 430-432 MHz and 438-440 MHz to the radiolocation service is on a secondary basis (see No. **5.32**).

5.274 Alternative allocation: in Denmark, Norway and Sweden, the bands 430-432 MHz and 438-440 MHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.275 Additional allocation: in Bosnia and Herzegovina, Croatia, Estonia, Finland, Latvia, The Former Yugoslav Republic of Macedonia, Libya, Slovenia and Yugoslavia, the bands 430-432 MHz and 438-440 MHz are also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-97)

5.276 Additional allocation: in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burkina Faso, Burundi, Egypt, the United Arab Emirates, Ecuador, Eritrea, Ethiopia, Greece, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Liechtenstein, Malaysia, Malta, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, the Dem. People's Rep. Of Korea, Singapore, Somalia, Switzerland, Tanzania, Thailand, Togo, Turkey and Yemen, the band 430-440 MHz is also allocated to the fixed service on a primary basis and the bands 430-435 MHz and 438-440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis. (WRC-97)

5.277 Additional allocation: in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo, Djibouti, Georgia, Hungary, Israel, Kazakstan, Latvia, Mali, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, the Russian Federation, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430-440 MHz is also allocated to the fixed service on a primary basis. (WRC-2000)

5.278 Different category of service: in Argentina, Colombia, Costa Rica, Cuba, Guyana, Honduras, Panama and Venezuela, the allocation of the band 430-440 MHz to the amateur service is on a primary basis (see No. **5.33**).

5.279 Additional allocation: in Mexico, the bands 430-435 MHz and 438-440 MHz are also allocated on a primary basis to the land mobile service, subject to agreement obtained under No. **9.21**.

5.280 In Germany, Austria, Bosnia and Herzegovina, Croatia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Portugal, Slovenia, Switzerland and Yugoslavia, the band 433.05-434.79 MHz (center frequency 433.92 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services of these countries operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. **15.13**.

5.281 Additional allocation: in the French Overseas Departments in Region 2 and India, the band 433.75-434.25 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis. In France and in Brazil, the band is allocated to the same service on a secondary basis.

5.282 In the bands 435-438 MHz, 1 260-1 270 MHz, 2 400-2 450 MHz, 3 400-3 410 MHz (in Regions 2 and 3 only) and 5 650-5 670 MHz, the amateur-satellite service may operate subject to not causing harmful interference to other services operating in accordance with the Table (see No. **5.43**). Administrations authorizing such use shall ensure that any harmful interference caused by emissions from a station in the amateur-satellite service is immediately eliminated in accordance with the provisions of No. **25.11**. The use of the bands 1 260-1 270 MHz and 5 650-5 670 MHz by the amateur-satellite service is limited to the Earth-to-space direction.

5.283 Additional allocation: in Austria, the band 438-440 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.284 Additional allocation: in Canada, the band 440-450 MHz is also allocated to the amateur service on a secondary basis.

5.285 Different category of service: in Canada, the allocation of the band 440-450 MHz to the radiolocation service is on a primary basis (see No. **5.33**).

5.286 The band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space), subject to agreement obtained under No. **9.21**.

5.286A The use of the bands 454-456 MHz and 459-460 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. (WRC-97)

5.286B The use of the band 454-455 MHz in the countries listed in No. **5.286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **5.286E**, by stations in the mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations. (WRC-97)

5.286C The use of the band 454-455 MHz in the countries listed in No. **5.286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **5.286E**, by stations in the mobile-satellite service, shall not constrain the development and use of the fixed and mobile services operating in accordance with the Table of Frequency Allocations. (WRC-97)

5.286D Additional allocation: in Canada, the United States, Mexico and Panama, the band 454-455 MHz is also allocated to the mobile-satellite service (Earth-to-space) on a primary basis. (WRC-97)

5.286E Additional allocation: in Cape Verde, Indonesia, Nepal, Nigeria and Papua New Guinea, the bands 454-456 MHz and 459-460 MHz are also allocated to the mobile-satellite (Earth-to-space) service on a primary basis. (WRC-97)

5.287 In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174 (see Resolution **341 (WRC-97**)). (WRC-97)

5.288 In the territorial waters of the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174.

5.289 Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460-470 MHz and 1 690-1 710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.

5.290 Different category of service: in Afghanistan, Azerbaijan, Belarus, China, Japan, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 460-470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. (WRC-2000).

5.291 Additional allocation: in China, the band 470-485 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis subject to agreement obtained under No. **9.21** and subject to not causing harmful interference to existing and planned broadcasting stations.

5.291A Additional allocation: in Germany, Austria, Denmark, Estonia, Finland, Liechtenstein, Norway, Netherlands, the Czech Rep. and Switzerland, the band 470-494 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97**). (WRC-97)

5.292 Different category of service: in Mexico and Venezuela, the allocation of the band 470-512 MHz to the fixed and mobile services, and in Argentina and Uruguay to the mobile service, is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

5.293 Different category of service: in Canada, Chile, Colombia, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. (WRC-2000)

5.294 Additional allocation: in Burundi, Cameroon, the Congo, Ethiopia, Israel, Kenya, Lebanon, Libya, Malawi, Senegal, Sudan, Syria, and Yemen, the band 470-582 MHz is also allocated to the fixed service on a secondary basis.

5.295 Not used.

5.296 Additional allocation: in Germany, Austria, Belgium, Cyprus, Denmark, Spain, Finland, France, Ireland, Israel, Italy, Libya, Lithuania, Malta, Morocco, Monaco, Norway, the Netherlands, Portugal, Syria, the United Kingdom, Sweden, Switzerland, Swaziland and Tunisia, the band 470-790 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote. (WRC-2000)

5.297 Additional allocation: in Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana, Honduras, Jamaica and Mexico, the band 512-608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-2000)

5.298 Additional allocation: in India, the band 549.75-550.25 MHz is also allocated to the space operation service (space-to-Earth) on a secondary basis.

5.299 Not used.

5.300 Additional allocation: in Israel, Libya, Syria and Sudan, the band 582-790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis.

5.301 Not used.

5.302 Additional allocation: in the United Kingdom, the band 590-598 MHz is also allocated to the aeronautical radionavigation service on a primary basis. All new assignments to stations in the aeronautical radionavigation service, including those transferred from the adjacent bands, shall be subject to coordination with the Administrations of the following countries: Germany, Belgium, Denmark, Spain, France, Ireland, Luxembourg, Morocco, Norway and the Netherlands.

5.303 Not used.

5.304 Additional allocation: in the African Broadcasting Area (see Nos. **5.10** to **5.13**), the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.305 Additional allocation: in China, the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.306 Additional allocation: in Region 1, except in the African Broadcasting Area (see Nos. **5.10** to **5.13**), and in Region 3, the band 608-614 MHz is also allocated to the radio astronomy service on a secondary basis.

5.307 Additional allocation: in India, the band 608-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.308 Not used.

5.309 Different category of service: in Costa Rica, El Salvador and Honduras, the allocation of the band 614-806 MHz to the fixed service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

5.310 (SUP - WRC-97)

5.311 Within the frequency band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service subject to agreement between the administrations concerned and those having services, operating in accordance with the Table, which may be affected (see Resolutions **33 (Rev.WRC-97)** and **507**). Such stations shall not produce a power flux-density in excess of the value –129 dB(W/m 2) for angles of arrival less than 20° (see Recommendation **705**) within the territories of other countries without the consent of the administrations of those countries.

5.312 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Hungary, Kazakstan, Latvia, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 645-862 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-97)

5.313 (SUP - WRC-97)

5.314 Additional allocation: in Austria, Italy, Moldova, Uzbekistan, the United Kingdom and Swaziland, the band 790-862 MHz is also allocated to the land mobile service on a secondary basis. (WRC-2000)

5.315 Alternative allocation: in Greece, Italy and Tunisia, the band 790-838 MHz is allocated to the broadcasting service on a primary basis. (WRC-2000)

5.316 Additional allocation: in Germany, Saudi Arabia, Bosnia and Herzegovina, Burkina Faso, Cameroon, Côte d'Ivoire, Croatia, Denmark, Egypt, Finland, Israel, Kenya, The Former Yugoslav Republic of Macedonia, Libya, Liechtenstein, Monaco, Norway, the Netherlands, Portugal, Syria, Sweden, Switzerland and Yugoslavia, the band 790-830 MHz, and in these same countries and in Spain, France, Gabon and Malta, the band 830-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the mobile service in the countries mentioned in

connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band. (WRC-2000)

5.317 Additional allocation: in Region 2 (except Brazil and the United States), the band 806-890 MHz is also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. The use of this service is intended for operation within national boundaries.

5.317A Administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000) may use those parts of the band 806-960 MHz which are allocated to the mobile service on a primary basis and are used or planned to be used for mobile systems (see Resolution **224 (WRC-2000**)). This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-2000)

5.318 Additional allocation: in Canada, the United States and Mexico, the bands 849-851 MHz and 894-896 MHz are also allocated to the aeronautical mobile service on a primary basis, for public correspondence with aircraft. The use of the band 849-851 MHz is limited to transmissions from aeronautical stations and the use of the band 894-896 MHz is limited to transmissions from aircraft stations.

5.319 Additional allocation: in Belarus, Russian Federation and Ukraine, the bands 806-840 MHz (Earth-to-space) and 856-890 MHz (space-to-Earth) are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service. The use of these bands by this service shall not cause harmful interference to, or claim protection from, services in other countries operating in accordance with the Table of Frequency Allocations and is subject to special agreements between the administrations concerned.

5.320 Additional allocation: in Region 3, the bands 806-890 MHz and 942-960 MHz are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service on a primary basis, subject to agreement obtained under No. **9.21**. The use of this service is limited to operation within national boundaries. In seeking such agreement, appropriate protection shall be afforded to services operating in accordance with the Table, to ensure that no harmful interference is caused to such services.

5.321 Alternative allocation: in Italy, the band 838-854 MHz is allocated to the broadcasting service on a primary basis as from 1 January 1995.

5.322 In Region 1, in the band 862-960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. **5.10** to **5.13**) excluding Algeria, Egypt, Spain, Libya, Morocco, Namibia, Nigeria, South Africa, Tanzania, Zimbabwe and Zambia, subject to agreement obtained under No. **9.21**. (WRC-2000)

5.323 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, Hungary, Kazakstan, Latvia, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 862-960 MHz is also allocated to the aeronautical radionavigation service on a primary basis. Such use is subject to agreement obtained under No. **9.21** with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime. (WRC-97).

5.324 Not used.

5.325 Different category of service: in the United States, the allocation of the band 890-942 MHz to the radiolocation service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

5.325A Different category of service: in Cuba, the allocation of the band 902-915 MHz to the land mobile service is on a primary basis. (WRC-2000)

5.326 Different category of service: in Chile, the band 903-905 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis, subject to agreement obtained under No. **9.21**.

5.327 Different category of service: in Australia, the allocation of the band 915-928 MHz to the

radiolocation service is on a primary basis (see No. **5.33**).

5.328 The use of the band 960-1 215 MHz by the aeronautical radionavigation service is reserved on a worldwide basis for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities. (WRC-2000)

5.328A Additional allocation: the band 1 164-1 215 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. The aggregate power flux-density produced by all the space stations of all radionavigation-satellite systems at the Earth's surface shall not exceed the provisional value of –115 dB(W/m 2) in any 1 MHz band for all angles of arrival. Stations in the radionavigation-satellite service shall not cause harmful interference to, nor claim protection from, stations of the aeronautical-radionavigation service. The provisions of Resolution **605 (WRC-2000)** apply. (WRC-2000)

5.329 Use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. **5.331**. See also Resolution **606 (WRC-2000**). (WRC-2000)

5.329A Use of systems in the radionavigation-satellite service (space-to-space) operating in the bands 1 215-1 300 MHz and 1 559-1 610 MHz is not intended to provide safety service applications, and shall not impose any additional constraints on other systems or services operating in accordance with the Table. (WRC-2000)

5.330 Additional allocation: in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Morocco, Mozambique, Nepal, Nigeria, Pakistan, the Philippines, Qatar, Syria, Somalia, Sudan, Sri Lanka, Chad, Togo and Yemen, the band 1 215-1 300 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-97)

5.331 Additional allocation: in Algeria, Germany, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Burundi, Cameroon, China, Croatia, Denmark, the United Arab Emirates, France, Greece, India, Iran (Islamic Republic of), Iraq, Kenya, The Former Yugoslav Republic of Macedonia, Liechtenstein, Luxembourg, Mali, Mauritania, Norway, Oman, the Netherlands, Portugal, Qatar, Senegal, Slovenia, Somalia, Sudan, Sri Lanka, Sweden, Switzerland, Turkey and Yugoslavia, the band 1 215-1 300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.332 In the band 1 215-1 260 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the radionavigation-satellite service and other services allocated on a primary basis. (WRC-2000)

5.333 (SUP - WRC-97)
5.334 Additional allocation: in Canada and the United States, the bands 1 240-1 300 MHz and 1 350-1 370 MHz are also allocated to the aeronautical radionavigation service on a primary basis.

5.335 In Canada and the United States in the band 1 240-1 300 MHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause interference to, claim protection from, or otherwise impose constraints on operation or development of the aeronautical radionavigation service. (WRC-97).

5.335A In the band 1 260-1 300 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service and other services allocated by footnotes on a primary basis. (WRC-2000)

5.336 Not used.

5.337 The use of the bands 1 300-1 350 MHz, 2 700-2 900 MHz and 9 000-9 200 MHz by the aeronautical radionavigation service is restricted to ground-based radars and to associated airborne

transponders which transmit only on frequencies in these bands and only when actuated by radars operating in the same band.

5.337A The use of the band 1 300-1 350 MHz by earth stations in the radionavigation-satellite service and by stations in the radiolocation service shall not cause harmful interference to, nor constrain the operation and development of, the aeronautical-radionavigation service. (WRC-2000).

5.338 In Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Romania and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1 350-1 400 MHz. (WRC-2000)

5.339 The bands 1 370-1 400 MHz, 2 640-2 655 MHz, 4 950-4 990 MHz and 15.20-15.35 GHz are also allocated to the space research (passive) and earth exploration-satellite (passive) services on a secondary basis.

5.340 All emissions are prohibited in the following bands:
1 400-1 427 MHz,
2 690-2 700 MHz, except those provided for by Nos. **5.421** and **5.422**,
10.68-10.7 GHz, except those provided for by No. **5.483**,
15.35-15.4 GHz, except those provided for by No. **5.511**,
23.6-24 GHz,
31.3-31.5 GHz,
31.5-31.8 GHz, in Region 2,
48.94-49.04 GHz, from airborne stations,
50.2-50.4 GHz[*] , except those provided for by No. **5.555A**,
52.6-54.25 GHz,
86-92 GHz,
100-102 GHz,
109.5-111.8 GHz,
114.25-116 GHz,
148.5-151.5 GHz,
164-167 GHz,
182-185 GHz, except those provided for by No. **5.563**,
190-191.8 GHz,
200-209 GHz,
226-231.5 GHz,
250-252 GHz. (WRC-2000)

5.341 In the bands 1 400-1 727 MHz, 101-120 GHz and 197-220 GHz, passive research is being conducted by some countries in a programme for the search for intentional emissions of extraterrestrial origin.

5.342 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, Uzbekistan, Kyrgystan, the Russian Federation and Ukraine, the band 1 429-1 535 MHz is also allocated to the aeronautical mobile service on a primary basis exclusively for the purposes of aeronautical telemetry within the national territory. As of 1 April 2007, the use of the band 1 452-1 492 MHz is subject to agreement between the administrations concerned. (WRC-2000)

5.343 In Region 2, the use of the band 1 435-1 535 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

5.344 Alternative allocation: in the United States, the band 1 452-1 525 MHz is allocated to the fixed and mobile services on a primary basis (see also No. **5.343**).

[*] **5.340.1** The allocation to the earth exploration-satellite service (passive) and the space research service (passive) in the band 50.2-50.4 GHz should not impose undue constraints on the use of the adjacent bands by the primary allocated services in those bands. (WRC-97).

5.345 Use of the band 1 452-1 492 MHz by the broadcasting-satellite service, and by the broadcasting service, is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (WARC-92**).

5.346 Not used.

5.347 Different category of service: in Bangladesh, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cuba, Denmark, Egypt, Greece, Ireland, Italy, Kenya, Mozambique, Portugal, Sri Lanka, Swaziland, Yemen, Yugoslavia and Zimbabwe, the allocation of the band 1 452-1 492 MHz to the broadcasting-satellite service and the broadcasting service is on a secondary basis until 1 April 2007. (WRC-2000)

5.348 The use of the band 1 492-1 525 MHz by the mobile-satellite service is subject to coordination under No. **9.11**A. However, no coordination threshold in Article **21** for space stations of the mobile-satellite service with respect to terrestrial services shall apply to the situation referred to in No. **5.343**. With respect to the situation referred to in No. **5.343**, the requirement for coordination in the band 1 492-1 525 MHz will be determined by band overlap.

5.348A In the band 1 492-1 525 MHz, the coordination threshold in terms of the power flux-density levels at the surface of the Earth in application of No. **9.11A** for space stations in the mobile-satellite (space-to-Earth) service, with respect to the land mobile service use for specialized mobile radios or used in conjunction with public switched telecommunication networks (PSTN) operating within the territory of Japan, shall be –150 dB(W/m 2) in any 4 kHz band for all angles of arrival, instead of those given in Table 5-2 of Appendix **5.** The above threshold level of the power flux-density shall apply until it is changed by a competent world radiocommunication conference.

5.349 Different category of service: in Saudi Arabia, Azerbaijan, Bahrain, Bosnia and Herzegovina, Cameroon, Egypt, France, Iran (Islamic Republic of), Iraq, Israel, Kazakstan, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Morocco, Qatar, Syria, Kyrgyzstan, Romania, Turkmenistan, Yemen and Yugoslavia, the allocation of the band 1 525-1 530 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**). (WRC-2000)

5.350 Additional allocation: in Azerbaijan, Kyrgyzstan and Turkmenistan, the band 1 525-1 530 MHz is also allocated to the aeronautical mobile service on a primary basis. (WRC-2000)

5.351 The bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz shall not be used for feeder links of any service. In exceptional circumstances, however, an earth station at a specified fixed point in any of the mobile-satellite services may be authorized by an administration to communicate via space stations using these bands.

5.351A For the use of the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 500 MHz, 2 500-2 520 MHz and 2 670-2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev.WRC-97)** and **225 (WRC-2000**). (WRC-2000).

5.352 (SUP - WRC-97)

5.352A In the band 1 525-1 530 MHz, stations in the mobile-satellite service, except stations in the maritime mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed service in France and French overseas territories in Region 3, Algeria, Saudi Arabia, Egypt, Guinea, India, Israel, Italy, Jordan, Kuwait, Mali, Malta, Morocco, Mauritania, Nigeria, Oman, Pakistan, Philippines, Qatar, Syria, Tanzania, Viet Nam and Yemen notified prior to 1 April 1998. (WRC-97)

5.353 (SUP - WRC-97)

5.353A In applying the procedures of Section II of Article **9** to the mobile-satellite service in the bands 1 530-1 544 MHz and 1 626.5-1 645.5 MHz, priority shall be given to accommodating the spectrum requirements for distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS). Maritime mobile-satellite distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from,

distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution **222 (WRC-2000)** shall apply.) (WRC-2000)

5.354 The use of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz by the mobile-satellite services is subject to coordination under No. **9.11A**.

5.355 Additional allocation: in Bahrain, Bangladesh, Congo, Egypt, Eritrea, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Qatar, Syria, Somalia, Sudan, Chad, Togo and Yemen, the bands 1 540-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a secondary basis. (WRC-2000)

5.356 The use of the band 1 544-1 545 MHz by the mobile-satellite service (space-to-Earth) is limited to distress and safety communications (see Article **31**).

5.357 Transmissions in the band 1 545-1 555 MHz from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

5.357A In applying the procedures of Section II of Article **9** to the mobile-satellite service in the bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article **44**. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44** shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution **222 (WRC-2000)** shall apply.) (WRC-2000)

5.358 (SUP - WRC-97)

5.359 Additional allocation: in Germany, Saudi Arabia, Armenia, Austria, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Cameroon, Spain, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Jordan, Kazakstan, Kuwait, Latvia, Lebanon, Libya, Lithuania, Mali, Morocco, Mauritania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Syria, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, the Russian Federation, Senegal, Swaziland, Tajikistan, Tanzania, Tunisia, Turkmenistan and Ukraine, the bands 1 550-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a primary basis. Administrations are urged to make all practicable efforts to avoid the implementation of new fixed-service stations in these bands. (WRC-2000).

5.360 to **5.362** (SUP - WRC-97)
5.362A In the United States, in the bands 1 555-1 559 MHz and 1 656.5-1 660.5 MHz, the aeronautical mobile-satellite (R) service shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (WRC-97)

5.362B Additional allocation: The band 1 559-1 610 MHz is also allocated to the fixed service on a primary basis until 1 January 2005 in Germany, Armenia, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Spain, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, the Russian Federation, Senegal, Swaziland, Tajikistan, Tanzania, Turkmenistan and Ukraine, and until 1 January 2010 in Saudi Arabia, Cameroon, Jordan, Kuwait, Lebanon, Libya, Mali, Morocco, Mauritania, Syria and Tunisia. After these dates, the fixed service may continue to operate on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the

radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-2000)

5.362C Additional allocation: in Bahrain, Bangladesh, Congo, Egypt, Eritrea, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Qatar, Syria, Somalia, Sudan, Chad, Togo and Yemen, the band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-2000)

5.363 Alternative allocation: in Sweden, the band 1 590-1 626.5 MHz is allocated to the aeronautical radionavigation service on a primary basis.

5.364 The use of the band 1 610-1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to coordination under No. **9.11A**. A mobile earth station operating in either of the services in this band shall not produce a peak e.i.r.p. density in excess of –15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. **5.366** (to which No. **4.10** applies), unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, the mean e.i.r.p. density of a mobile earth station shall not exceed –3 dB(W/4 kHz). Stations of the mobile-satellite service shall not claim protection from stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. **5.366** and stations in the fixed service operating in accordance with the provisions of No. **5.359**. Administrations responsible for the coordination of mobile-satellite networks shall make all practicable efforts to ensure protection of stations operating in accordance with the provisions of No. **5.366**.

5.365 The use of the band 1 613.8-1 626.5 MHz by the mobile-satellite service (space-to-Earth) is subject to coordination under No. **9.11A**.

5.366 The band 1 610-1 626.5 MHz is reserved on a worldwide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Such satellite use is subject to agreement obtained under No. **9.21**.

5.367 Additional allocation: The bands 1 610-1 626.5 MHz and 5 000-5 150 MHz are also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. **9.21**.

5.368 With respect to the radiodetermination-satellite and mobile-satellite services the provisions of No. **4.10** do not apply in the band 1 610-1 626.5 MHz, with the exception of the aeronautical radionavigation-satellite service.

5.369 Different category of service: in Angola, Australia, Burundi, China, Côte d'Ivoire, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Israel, Jordan, Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Dem. Rep.of the Congo, Syria, Senegal, Sudan, Swaziland, Togo and Zambia, the allocation of the band 1 610-1 626.5 MHz to the radiodetermination-satellite service (Earth-to-space) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21** from countries not listed in this provision. (WRC-97)

5.370 Different category of service: in Venezuela, the allocation to the radiodetermination-satellite service in the band 1 610-1 626.5 MHz (Earth-to-space) is on a secondary basis.

5.371 Additional allocation: in Region 1, the bands 1 610-1 626.5 MHz (Earth-to-space) and 2 483.5-2 500 MHz (space-to-Earth) are also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. **9.21**.

5.372 Harmful interference shall not be caused to stations of the radio astronomy service using the band 1 610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **29.13** applies).

5.373 Not used.

5.373A (SUP - WRC-97)

5.374 Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5-1 634.5 MHz and 1 656.5-1 660 MHz shall not cause harmful interference to stations in the fixed service operating in the countries listed in No. **5.359**. (WRC-97)

5.375 The use of the band 1 645.5-1 646.5 MHz by the mobile-satellite service (Earth-to-space) and for inter-satellite links is limited to distress and safety communications (see Article **31**).

5.376 Transmissions in the band 1 646.5-1 656.5 MHz from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

5.376A Mobile earth stations operating in the band 1 660-1 660.5 MHz shall not cause harmful interference to stations in the radio astronomy service. (WRC-97)

5.377 In the band 1 675-1 710 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services (see Resolution **213 (Rev.WRC-95)**[*]) and the use of this band shall be subject to coordination under No. **9.11A**.

5.378 Not used.

5.379 Additional allocation: in Bangladesh, India, Indonesia, Nigeria and Pakistan, the band 1 660.5-1 668.4 MHz is also allocated to the meteorological aids service on a secondary basis.

5.379A Administrations are urged to give all practicable protection in the band 1 660.5-1 668.4 MHz for future research in radio astronomy, particularly by eliminating air-to-ground transmissions in the meteorological aids service in the band 1 664.4-1 668.4 MHz as soon as practicable.

5.380 The bands 1 670-1 675 MHz and 1 800-1 805 MHz are intended for use, on a worldwide basis, by administrations wishing to implement aeronautical public correspondence. The use of the band 1 670-1 675 MHz by stations in the systems for public correspondence with aircraft is limited to transmissions from aeronautical stations and the use of the band 1 800-1 805 MHz is limited to transmissions from aircraft stations.

5.381 Additional allocation: in Afghanistan, Costa Rica, Cuba, India, Iran (Islamic Republic of), Malaysia, Pakistan and Sri Lanka, the band 1 690-1 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-97)

5.382 Different category of service: in Saudi Arabia, Armenia, Austria, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Bulgaria, the Congo, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, Hungary, Iraq, Israel, Jordan, Kazakstan, Kuwait, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, Syria, Kyrgyzstan, Romania, Russian Federation, Somalia, Tajikistan, Tanzania, Turkmenistan, Ukraine, Yemen and Yugoslavia, the allocation of the band 1 690-1 700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**), and in the Dem. People's Rep. of Korea, the allocation of the band 1 690-1 700 MHz to the fixed service is on a primary basis (see No. **5.33**) and to the mobile, except aeronautical mobile, service on a secondary basis. (WRC-97)

5.383 Not used.

5.384 Additional allocation: in India, Indonesia and Japan, the band 1 700-1 710 MHz is also allocated to the space research service (space-to-Earth) on a primary basis. (WRC-97)

5.384A The bands, or portions of the bands, 1 710-1 885 MHz and 2 500-2 690 MHz, are identified for use by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000)

[*] *Note by the Secretariat:* This Resolution was abrogated by WRC-2000.

in accordance with Resolution **223 (WRC-2000**). This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations (WRC-2000).

5.385 Additional allocation: the band 1 718.8-1 722.2 MHz is also allocated to the radio astronomy service on a secondary basis for spectral line observations. (WRC-2000)

5.386 Additional allocation: the band 1 750-1 850 MHz is also allocated to the space operation (Earth-to-space) and space research (Earth-to-space) services in Region 2, in Australia, India, Indonesia and Japan on a primary basis, subject to agreement obtained under No. **9.21**, having particular regard to troposcatter systems.

5.387 Additional allocation: in Azerbaijan, Belarus, Georgia, Kazakstan, Mali, Mongolia, Kyrgyzstan, Slovakia, Romania, Tajikistan and Turkmenistan, the band 1 770-1 790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-2000)

5.388 The bands 1 885-2 025 MHz and 2 110-2 200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000). Such use does not preclude the use of these bands by other services to which they are allocated. The bands should be made available for IMT-2000 in accordance with Resolution **212 (Rev.WRC-97**). (See also Resolution **223 (WRC-2000**).) (WRC-2000)

5.388A In Regions 1 and 3, the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz and, in Region 2, the bands 1 885-1 980 MHz and 2 110-2 160 MHz may be used by high altitude platform stations as base stations to provide International Mobile Telecommunications-2000 (IMT-2000), in accordance with Resolution **221 (WRC-2000**). The use by IMT-2000 applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-2000)

5.389 Not used.

5.389A The use of the bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC-95) *** . The use of these bands shall not commence before 1 January 2000; however the use of the band 1 980-1 990 MHz in Region 2 shall not commence before 1 January 2005.

5.389B The use of the band 1 980-1 990 MHz by the mobile-satellite service shall not cause harmful interference to or constrain the development of the fixed and mobile services in Argentina, Brazil, Canada, Chile, Ecuador, the United States, Honduras, Jamaica, Mexico, Peru, Suriname, Trinidad and Tobago, Uruguay and Venezuela.

5.389C The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the mobile-satellite service shall not commence before 1 January 2002 and is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC-95)** [*] . (WRC-97)

5.389D In Canada and the United States the use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite service shall not commence before 1 January 2000.

5.389E The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite service in Region 2 shall not cause harmful interference to or constrain the development of the fixed and mobile services in Regions 1 and 3.

5.389F In Algeria, Benin, Cape Verde, Egypt, Iran (Islamic Republic of), Mali, Syria and Tunisia, the use of the bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service shall neither cause harmful interference to the fixed and mobile services, nor hamper the development of those services prior to 1 January 2005, nor shall the former service request protection from the latter services. (WRC-2000)

[*] *Note by the Secretariat:* This Resolution was revised by WRC-2000.

5.390 In Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Suriname and Uruguay, the use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite services shall not cause harmful interference to stations in the fixed and mobile services before 1 January 2005. After this date, the use of these bands is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC-95)**[*]. (WRC-2000)

5.391 In making assignments to the mobile service in the bands 2 025-2 110 MHz and 2 200-2 290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154, and shall take that Recommendation into account for the introduction of any other type of mobile system. (WRC-97)

5.392 Administrations are urged to take all practicable measures to ensure that space-to-space transmissions between two or more non-geostationary satellites, in the space research, space operations and Earth exploration-satellite services in the bands 2 025-2 110 MHz and 2 200-2 290 MHz, shall not impose any constraints on Earth-to-space, space-to-Earth and other space-to-space transmissions of those services and in those bands between geostationary and non-geostationary satellites.

5.392A Additional allocation: in Russian Federation, the band 2 160-2 200 MHz is also allocated to the space research service (space-to-Earth) on a primary basis until 1 January 2005. Stations in the space research service shall not cause harmful interference to, or claim protection from, stations in the fixed and mobile services operating in this frequency band.

5.393 Additional allocation: in the United States, India and Mexico, the band 2 310-2 360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial sound broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (WARC-92**), with the exception of resolves 3 in regard to the limitation on broadcasting-satellite systems in the upper 25 MHz. (WRC-2000)

5.394 In the United States, the use of the band 2 300-2 390 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services. In Canada, the use of the band 2 300-2 483.5 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services.

5.395 In France, the use of the band 2 310-2 360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

5.396 Space stations of the broadcasting-satellite service in the band 2 310-2 360 MHz operating in accordance with No. **5.393** that may affect the services to which this band is allocated in other countries shall be coordinated and notified in accordance with Resolution **33 (Rev.WRC-97**). Complementary terrestrial broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use.

5.397 Different category of service: in France, the band 2 450-2 500 MHz is allocated on a primary basis to the radiolocation service (see No. **5.33**). Such use is subject to agreement with administrations having services operating or planned to operate in accordance with the Table of Frequency Allocations which may be affected.

5.398 In respect of the radiodetermination-satellite service in the band 2 483.5-2 500 MHz, the provisions of No. **4.10** do not apply.

5.399 In Region 1, in countries other than those listed in No. **5.400**, harmful interference shall not be caused
to, or protection shall not be claimed from, stations of the radiolocation service by stations of the radiodetermination satellite service.

5.400 Different category of service: in Angola, Australia, Bangladesh, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Jordan, Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Dem. Rep. of the Congo, Syria, Sudan, Swaziland, Togo and Zambia, the allocation of the

[*] *Note by the Secretariat:* This Resolution was revised by WRC-2000.

band 2 483.5-2 500 MHz to the radiodetermination-satellite service (space-to-Earth) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21** from countries not listed in this provision. (WRC-97)

5.401 Not used.

5.402 The use of the band 2 483.5-2 500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the coordination under No. **9.11A**. Administrations are urged to take all practicable steps to prevent harmful interference to the radio astronomy service from emissions in the 2 483.5-2 500 MHz band, especially those caused by second-harmonic radiation that would fall into the 4 990-5 000 MHz band allocated to the radio astronomy service worldwide.

5.403 Subject to agreement obtained under No. **9.21**, the band 2 520-2 535 MHz (until 1 January 2005 the band 2 500-2 535 MHz) may also be used for the mobile-satellite (space-to-Earth), except aeronautical mobile-satellite, service for operation limited to within national boundaries. The provisions of No. **9.11A** apply.

5.404 Additional allocation: in India and Iran (Islamic Republic of), the band 2 500-2 516.5 MHz may also be used for the radiodetermination-satellite service (space-to-Earth) for operation limited to within national boundaries, subject to agreement obtained under No. **9.21**.

5.405 Additional allocation: in France, the band 2 500-2 550 MHz is also allocated to the radiolocation service on a primary basis. Such use is subject to agreement with the administrations having services operating or planned to operate in accordance with the Table which may be affected.

5.406 Not used.

5.407 In the band 2 500-2 520 MHz, the power flux-density at the surface of the Earth from space stations operating in the mobile-satellite (space-to-Earth) service shall not exceed –152 dB(W/(m 2 □4 kHz)) in Argentina, unless otherwise agreed by the administrations concerned.

5.408 (SUP - WRC-2000)

5.409 Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in the band 2 500-2 690 MHz.

5.410 The band 2 500-2 690 MHz may be used for tropospheric scatter systems in Region 1, subject to agreement obtained under No. **9.21**.

5.411 When planning new tropospheric scatter radio-relay links in the band 2 500-2 690 MHz, all possible measures shall be taken to avoid directing the antennae of these links towards the geostationary-satellite orbit.

5.412 Alternative allocation: in Azerbaijan, Bulgaria, Kyrgyzstan and Turkmenistan, the band 2 500-2 690 MHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-2000)

5.413 In the design of systems in the broadcasting-satellite service in the bands between 2 500 MHz and 2 690 MHz, administrations are urged to take all necessary steps to protect the radio astronomy service in the band 2 690-2 700 MHz.

5.414 The allocation of the frequency band 2 500-2 520 MHz to the mobile-satellite service (space-to-Earth) shall be effective on 1 January 2005 and is subject to coordination under No. **9.11A**.

5.415 The use of the bands 2 500-2 690 MHz in Region 2 and 2 500-2 535 MHz and 2 655-2 690 MHz in Region 3 by the fixed-satellite service is limited to national and regional systems, subject to agreement obtained under No. **9.21**, giving particular attention to the broadcasting-satellite service in Region 1. In the direction space-to-Earth, the power flux-density at the Earth's surface shall not exceed the values given in Article **21**, Table **21-4**.

5.415A Additional allocation: in India and Japan, subject to agreement obtained under No. **9.21**, the band 2 515-2 535 MHz may also be used for the aeronautical mobile-satellite service (space-to-Earth) for operation limited to within their national boundaries. (WRC-2000).

5.416 The use of the band 2 520-2 670 MHz by the broadcasting-satellite service is limited to national and regional systems for community reception, subject to agreement obtained under No. **9.21**. The power flux-density at the Earth's surface shall not exceed the values given in Article **21**, Table **21-4**.

5.417 (SUP - WRC-2000)

5.418 Additional allocation: in Bangladesh, Belarus, Korea (Rep. of), India, Japan, Pakistan, Singapore, Sri Lanka and Thailand, the band 2 535-2 655 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (WARC-92**). The provisions of No. **5.416** and Table **21-4** of Article **2**1, do not apply to this additional allocation. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to Resolution **539 (WRC-2000**). (WRC-2000)

5.418A In certain Region 3 countries listed in No. **5.418**, use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound) for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12A**, in respect of geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received after 2 June 2000, and No. **22.2** does not apply. No. **22.2** shall continue to apply with respect to geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received before 3 June 2000. Use of the band by non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to the provisions of Resolution **539 (WRC-2000**), and such systems shall be in accordance with Resolution **528 (WARC-92**). (WRC-2000)

5.418B Use of the band 2 630-2 655 MHz by non-geostationary-satellite systems for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12**. Resolution **539 (WRC-2000)** applies. (WRC-2000)
5.418C Use of the band 2 630-2 655 MHz by geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000 is subject to the application of the provisions of No. **9.13** with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), and No. **22.2** does not apply. Resolution **539 (WRC-2000)** applies. (WRC-2000)

5.419 The allocation of the frequency band 2 670-2 690 MHz to the mobile-satellite service shall be effective from 1 January 2005. When introducing systems of the mobile-satellite service in this band, administrations shall take all necessary steps to protect the satellite systems operating in this band prior to 3 March 1992. The coordination of mobile-satellite systems in the band shall be in accordance with No. **9.11A**.

5.420 The band 2 655-2 670 MHz (until 1 January 2005 the band 2 655-2 690 MHz) may also be used for the mobile-satellite (Earth-to-space), except aeronautical mobile-satellite, service for operation limited to within national boundaries, subject to agreement obtained under No. **9.21**. The coordination under No. **9.11A** applies.

5.420A Additional allocation: in India and Japan, subject to agreement obtained under No. **9.21**, the band 2 670-2 690 MHz may also be used for the aeronautical mobile-satellite service (Earth-to-space) for operation limited to within their national boundaries. (WRC-2000)

5.421 Additional allocation: in Germany and Austria, the band 2 690-2 695 MHz is also allocated to the fixed service on a primary basis. Such use is limited to equipment in operation by 1 January 1985.

5.422 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Brunei Darussalam, Congo, Côte d'Ivoire, Cuba, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan,

Lebanon, Malaysia, Mali, Mauritania, Moldova, Mongolia, Nigeria, Oman, Uzbekistan, Pakistan, the Philippines, Qatar, Syria, Kyrgyzstan, the Dem. Rep. of the Congo, Romania, the Russian Federation, Somalia, Tajikistan, Tunisia, Turkmenistan, Ukraine, Yemen and Yugoslavia, the band 2 690-2 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-2000).

5.423 In the band 2 700-2 900 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the aeronautical radionavigation service.

5.424 Additional allocation: in Canada, the band 2 850-2 900 MHz is also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars.

5.425 In the band 2 900-3 100 MHz, the use of the shipborne interrogator-transponder system (SIT) shall be confined to the sub-band 2 930 -2 950 MHz.

5.426 The use of the band 2 900-3 100 MHz by the aeronautical radionavigation service is limited to ground-based radars.

5.427 In the bands 2 900-3 100 MHz and 9 300-9 500 MHz, the response from radar transponders shall not be capable of being confused with the response from radar beacons (racons) and shall not cause interference to ship or aeronautical radars in the radionavigation service, having regard, however, to No. **4.9**.

5.428 Additional allocation: in Azerbaijan, Bulgaria, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3 100-3 300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.429 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, the Congo, Korea (Rep. of), the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Malaysia, Oman, Pakistan, Qatar, Syria, Dem. People's Rep. of Korea and Yemen, the band 3 300-3 400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service. (WRC-97)

5.430 Additional allocation: in Azerbaijan, Bulgaria, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3 300-3 400 MHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.431 Additional allocation: in Germany, Israel, Nigeria and the United Kingdom, the band 3 400-3 475 MHz is also allocated to the amateur service on a secondary basis.

5.432 Different category of service: in Korea (Rep. of), Japan and Pakistan, the allocation of the band 3 400-3 500 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**). (WRC-2000)

5.433 In Regions 2 and 3, in the band 3 400-3 600 MHz the radiolocation service is allocated on a primary basis. However, all administrations operating radiolocation systems in this band are urged to cease operations by 1985. Thereafter, administrations shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service.

5.434 (SUP - WRC-97)

5.435 In Japan, in the band 3 620-3 700 MHz, the radiolocation service is excluded.

5.436 Not used.

5.437 (SUP - WRC-2000)

5.438 Use of the band 4 200-4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the

ground. However, passive sensing in the earth exploration-satellite and space research services may be authorized in this band on a secondary basis (no protection is provided by the radio altimeters).

5.439 Additional allocation: in Iran (Islamic Republic of) and Libya, the band 4 200-4 400 MHz is also allocated to the fixed service on a secondary basis. (WRC-2000).

5.440 The standard frequency and time signal-satellite service may be authorized to use the frequency 4 202 MHz for space-to-Earth transmissions and the frequency 6 427 MHz for Earth-to-space transmissions. Such transmissions shall be confined within the limits of □2 MHz of these frequencies, subject to agreement obtained under No. **9.21**.

5.441 The use of the bands 4 500-4 800 MHz (space-to-Earth), 6 725-7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000).

5.442 In the bands 4 825-4 835 MHz and 4 950-4 990 MHz, the allocation to the mobile service is restricted to the mobile, except aeronautical mobile, service.

5.443 Different category of service: in Argentina, Australia and Canada, the allocation of the bands 4 825-4 835 MHz and 4 950-4 990 MHz to the radio astronomy service is on a primary basis (see No. **5.33**).

5.443A Additional allocation: The band 5 000-5 010 MHz is also allocated to the radionavigation-satellite service (Earth-to-space) on a primary basis. See Resolution **603 (WRC-2000**). (WRC-2000)

5.443B Additional allocation: The band 5 010-5 030 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed –124.5 dB(W/m 2) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, the aggregate power flux-density produced in the 4 990-5 000 MHz band by all the space stations within any radionavigation-satellite service (space-to-Earth) system operating in the 5 010-5 030 MHz band shall not exceed the provisional value of –171 dB(W/m 2) in a 10 MHz band at any radio astronomy observatory site for more than 2% of the time. For the use of this band, Resolution **604 (WRC-2000)** applies. (WRC-2000)

5.444 The band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **5.444A** and Resolution **114 (WRC-95)**
apply. (WRC-2000)

5.444A Additional allocation: the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems and is subject to coordination under No. **9.11A**.

In the band 5 091-5 150 MHz, the following conditions also apply:

- prior to 1 January 2010, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (WRC-95**);

- prior to 1 January 2010, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;

- after 1 January 2008, no new assignments shall be made to stations providing feeder links of non-geostationary mobile-satellite systems;

- after 1 January 2010, the fixed-satellite service will become secondary to the aeronautical
  radionavigation service.

5.445 Not used.

5.446 Additional allocation: in the countries listed in Nos. **5.369** and **5.400**, the band 5 150-5 216 MHz is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis, subject to agreement obtained under No. **9.2**1. In Region 2, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis. In Regions 1 and 3, except those countries listed in Nos. **5.369** and **5.400**, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a secondary basis. The use by the radiodetermination-satellite service is limited to feeder links in conjunction with the radiodetermination-satellite service operating in the bands 1 610-1 626.5 MHz and/or 2 483.5-2 500 MHz. The total power flux-density at the Earth's surface shall in no case exceed –159 dB(W/m 2) in any 4 kHz band for all angles of arrival.

5.447 Additional allocation: in Germany, Austria, Belgium, Denmark, Spain, Estonia, Finland, France, Greece, Israel, Italy, Japan, Jordan, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Norway, Pakistan, the Netherlands, Portugal, Syria, the United Kingdom, Sweden, Switzerland and Tunisia, the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-2000)

5.447A The allocation to the fixed-satellite service (Earth-to-space) is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

5.447B Additional allocation: the band 5 150-5 216 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. This allocation is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to provisions of No. **9.11A**. The power flux-density at the Earth's surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5 150-5216 MHz shall in no case exceed –164 dB(W/m^2) in any 4 kHz band for all angles of arrival.

5.447C Administrations responsible for fixed-satellite service networks in the band 5 150-5 250 MHz operated under Nos. **5.447A** and **5.447B** shall coordinate on an equal basis in accordance with No. **9.11A** with administrations responsible for non-geostationary-satellite networks operated under No. **5.446** and brought into use prior to 17 November 1995. Satellite networks operated under No. **5.446** brought into use after 17 November 1995 shall not claim protection from, and shall not cause harmful interference to, stations of the fixed-satellite service operated under Nos. **5.447A** and **5.447B**.

5.447D The allocation of the band 5 250-5 255 MHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis. (WRC-97)

5.448 Additional allocation: in Austria, Azerbaijan, Bulgaria, Libya, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Romania and Turkmenistan, the band 5 250-5 350 MHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.448A The use of the frequency band 5 250-5 350 MHz by the earth exploration-satellite (active) and space research (active) services shall not constrain the future development and deployment of the radiolocation service. (WRC-97)

5.448B The earth exploration-satellite (active) service operating in the band 5 350-5 460 MHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service. (WRC-97)

5.449 The use of the band 5 350-5 470 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons.

5.450 Additional allocation: in Austria, Azerbaijan, Bulgaria, Iran (Islamic Republic of), Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Turkmenistan and Ukraine, the band 5 470-5 650 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-97)

5.451 Additional allocation: in the United Kingdom, the band 5 470-5 850 MHz is also allocated to the land mobile service on a secondary basis. The power limits specified in Nos. **21.2**, **21.3**, **21.4** and **21.5** shall apply in the band 5 725-5 850 MHz.

5.452 Between 5 600 MHz and 5 650 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the maritime radionavigation service.

5.453 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo, Korea (Rep. of), Egypt, the United Arab Emirates, Gabon, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Madagascar, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, the Dem. People's Rep. of Korea, Singapore, Swaziland, Tanzania, Chad and Yemen, the band 5 650-5 850 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-2000)

5.454 Different category of service: in Azerbaijan, Belarus, Georgia, Mongolia, Uzbekistan, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 5 670-5 725 MHz to the space research service is on a primary basis (see No. **5.33**). (WRC-2000)

5.455 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, Cuba, Georgia, Hungary, Kazakstan, Latvia, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 5 670-5 850 MHz is also allocated to the fixed service on a primary basis.

5.456 Additional allocation: in Germany and in Cameroon, the band 5 755-5 850 MHz is also allocated to the fixed service on a primary basis.

5.457 Not used.

5.458 In the band 6 425-7 075 MHz, passive microwave sensor measurements are carried out over the oceans. In the band 7 075-7 250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the Earth exploration-satellite (passive) and space research (passive) services in their future planning of the bands 6 425-7 025 MHz and 7 075-7 250 MHz.

5.458A In making assignments in the band 6 700-7 075 MHz to space stations of the fixed-satellite service, administrations are urged to take all practicable steps to protect spectral line observations of the radio astronomy service in the band 6 650-6 675.2 MHz from harmful interference from unwanted emissions.

5.458B The space-to-Earth allocation to the fixed-satellite service in the band 6 700-7 075 MHz is limited to feeder links for non-geostationary satellite systems of the mobile-satellite service and is subject to coordination under No. **9.11A**. The use of the band 6 700-7 075 MHz (space-to-Earth) by feeder links for non-geostationary satellite systems in the mobile-satellite service is not subject to No. **22.2**.

5.458C Administrations making submissions in the band 7 025-7 075 MHz (Earth-to-space) for geostationary-satellite systems in the fixed-satellite service after 17 November 1995 shall consult on the

basis of relevant ITU-R Recommendations with the administrations that have notified and brought into use non-geostationary-satellite systems in this frequency band before 18 November 1995 upon request of the latter administrations. This consultation shall be with a view to facilitating shared operation of both geostationary-satellite systems in the fixed-satellite service and non-geostationary-satellite systems in this band.

5.459 Additional allocation: in Russian Federation, the frequency bands 7 100-7 155 MHz and 7 190-7 235 MHz are also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-97)

5.460 Additional allocation: the band 7 145-7 235 MHz is also allocated to the space research (Earth-to-space) service on a primary basis, subject to agreement obtained under No. **9.21**. The use of the band 7 145-7 190 MHz is restricted to deep space; no emissions to deep space shall be effected in the band 7 190-7 235 MHz.

5.461 Additional allocation: the bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**.

5.461A The use of the band 7 450-7 550 MHz by the meteorological-satellite service (space-to-Earth) is limited to geostationary-satellite systems. Non-geostationary meteorological-satellite systems in this band notified before 30 November 1997 may continue to operate on a primary basis until the end of their lifetime. (WRC-97).

5.461B The use of the band 7 750-7 850 MHz by the meteorological-satellite service (space-to-Earth) is limited to non-geostationary satellite systems. (WRC-97)

5.462 (SUP - WRC-97)

5.462A In Regions 1 and 3 (except for Japan), in the band 8 025-8 400 MHz, the earth exploration-satellite service using geostationary satellites shall not produce a power flux-density in excess of the following provisional values for angles of arrival ( ), without the consent of the affected administration:

–174 dB(W/m^2) in a 4 kHz band	for $0^0 \le \theta < 5^0$
–174 + 0.5 – 5) dB(W/m 2) in a 4 kHz band	for $5^0 \le \theta < 25^0$
–164 dB(W/m 2) in a 4 kHz band	for $5^0 \le \theta \le 90^0$

These values are subject to study under Resolution **124 (WRC-97)**[*]. (WRC-97)

5.463 Aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz. (WRC-97)

5.464 (SUP - WRC-97)

5.465 In the space research service, the use of the band 8 400-8 450 MHz is limited to deep space.

5.466 Different category of service: in Israel, Malaysia, Singapore and Sri Lanka, the allocation of the band 8 400-8 500 MHz to the space research service is on a secondary basis (see No. **5.32**). (WRC-97)

5.467 Alternative allocation: in the United Kingdom, the band 8 400-8 500 MHz is allocated to the radiolocation and space research services on a primary basis.

5.468 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, the Congo, Costa Rica, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, Qatar, Syria, Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, Swaziland, Tanzania, Chad, Togo, Tunisia and Yemen, the band 8 500-8 750 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-97)

5.469 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Hungary, Lithuania,

[*] *Note by the Secretariat:* This Resolution was revised by WRC-2000.

Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 8 500-8 750 MHz is also allocated to the land mobile and radionavigation services on a primary basis. (WRC-2000)

5.469A In the band 8 550-8 650 MHz, stations in the earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radiolocation service. (WRC-97)

5.470 The use of the band 8 750-8 850 MHz by the aeronautical radionavigation service is limited to airborne Doppler navigation aids on a centre frequency of 8 800 MHz.

5.471 Additional allocation: in Algeria, Germany, Bahrain, Belgium, China, the United Arab Emirates, France, Greece, Indonesia, Iran (Islamic Republic of), Libya, the Netherlands, Qatar and Sudan, the bands 8 825-8 850 MHz and 9 000-9 200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars only.

5.472 In the bands 8 850-9 000 MHz and 9 200-9 225 MHz, the maritime radionavigation service is limited to shore-based radars.

5.473 Additional allocation: in Armenia, Austria, Azerbaijan, Belarus, Bulgaria, Cuba, Georgia, Hungary, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the bands 8 850-9 000 MHz and 9 200-9 300 MHz are also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.474 In the band 9 200-9 500 MHz, search and rescue transponders (SART) may be used, having due regard to the appropriate ITU-R Recommendation (see also Article **31**).

5.475 The use of the band 9 300-9 500 MHz by the aeronautical radionavigation service is limited to airborne weather radars and ground-based radars. In addition, ground-based radar beacons in the aeronautical radionavigation service are permitted in the band 9 300-9 320 MHz on condition that harmful interference is not caused to the maritime radionavigation service. In the band 9 300-9 500 MHz, ground-based radars used for meteorological purposes have priority over other radiolocation devices.

5.476 In the band 9 300-9 320 MHz in the radionavigation service, the use of shipborne radars, other than those existing on 1 January 1976, is not permitted until 1 January 2001.

5.476A In the band 9 500-9 800 MHz, stations in the earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radionavigation and radiolocation services. (WRC-97)

5.477 Different category of service: in Algeria, Saudi Arabia, Austria, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Pakistan, Qatar, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Sweden, Trinidad and Tobago, and Yemen, the allocation of the band 9 800-10 000 MHz to the fixed service is on a primary basis (see No. **5.33**). (WRC-2000)

5.478 Additional allocation: in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Turkmenistan and Ukraine, the band 9 800-10 000 MHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.479 The band 9 975-10 025 MHz is also allocated to the meteorological-satellite service on a secondary basis for use by weather radars.

5.480 Additional allocation: in Argentina, Brazil, Chile, Costa Rica, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Peru, Uruguay and Venezuela, the band 10-10.45 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-2000)

5.481 Additional allocation: in Germany, Angola, Brazil, China, Costa Rica, El Salvador, Ecuador, Spain, Guatemala, Japan, Morocco, Nigeria, Oman, Uzbekistan, Paraguay, Peru, the Dem. People’s Rep. of

Korea, Sweden, Tanzania, Thailand and Uruguay, the band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-2000)

5.482 In the band 10.6-10.68 GHz, stations of the fixed and mobile, except aeronautical mobile, services shall be limited to a maximum equivalent isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed –3 dBW. These limits may be exceeded subject to agreement obtained under No. **9.21**. However, in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, China, the United Arab Emirates, Georgia, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakstan, Kuwait, Latvia, Lebanon, Moldova, Nigeria, Uzbekistan, Pakistan, the Philippines, Qatar, Syria, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the restrictions on the fixed and mobile, except aeronautical mobile, services are not applicable.

5.483 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, China, Colombia, Korea (Rep. of), Costa Rica, Egypt, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kazakstan, Kuwait, Latvia, Lebanon, Moldova, Mongolia, Uzbekistan, Qatar, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, Yemen and Yugoslavia, the band 10.68-10.7 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-2000)

5.484 In Region 1, the use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service.

5.484A The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000).

5.485 In Region 2, in the band 11.7-12.2 GHz, transponders on space stations in the fixed-satellite service may be used additionally for transmissions in the broadcasting-satellite service, provided that such transmissions do not have a maximum e.i.r.p. greater than 53 dBW per television channel and do not cause greater interference or require more protection from interference than the coordinated fixed-satellite service frequency assignments. With respect to the space services, this band shall be used principally for the fixed-satellite service.

5.486 Different category of service: in Mexico and the United States, the allocation of the band 11.7-12.1 GHz to the fixed service is on a secondary basis (see No. **5.32**).

5.487 In the band 11.7-12.5 GHz in Regions 1 and 3, the fixed, fixed-satellite, mobile, except aeronautical mobile, and broadcasting services, in accordance with their respective allocations, shall not cause harmful interference to, or claim protection from, broadcasting-satellite stations operating in accordance with the provisions of the Regions 1 and 3 Plan in Appendix **30**. (WRC-2000)

5.487A Additional allocation: in Region 1, the band 11.7-12.5 GHz, in Region 2, the band 12.2-12.7 GHz and, in Region 3, the band 11.7-12.2 GHz, are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the broadcasting-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification

information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geosationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000)

5.488 The use of the band 11.7-12.2 GHz by geostationary-satellite networks in the fixed-satellite service in Region 2 is subject to the provisions of Resolution **77 (WRC-2000**). For the use of the band 12.2-12.7 GHz by the broadcasting-satellite service in Region 2, see Appendix **30**. (WRC-2000)

5.489 Additional allocation: in Peru, the band 12.1-12.2 GHz is also allocated to the fixed service on a primary basis.

5.490 In Region 2, in the band 12.2-12.7 GHz, existing and future terrestrial radiocommunication services shall not cause harmful interference to the space services operating in conformity with the broadcasting-satellite Plan for Region 2 contained in Appendix **30**.

5.491 Additional allocation: in Region 3, the band 12.2-12.5 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. The power flux-density limits in Table **21-4** of Article **21** shall apply to this frequency band. The introduction of the service in relation to the broadcasting-satellite service in Region 1 shall follow the procedures specified in Article 7 of Appendix **30**, with the applicable frequency band extended to cover 12.2-12.5 GHz. (WRC-2000)

5.492 Assignments to stations of the broadcasting-satellite service which are in conformity with the appropriate regional Plan or included in the Regions 1 and 3 List in Appendix **30** may also be used for transmissions in the fixed-satellite service (space-to-Earth), provided that such transmissions do not cause more interference, or require more protection from interference, than the broadcasting-satellite service transmissions operating in conformity with the Plan or the List, as appropriate. (WRC-2000)

5.493 The broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3 is limited to a power flux-density not exceeding –111 dB(W/(m 2 □27 MHz)) for all conditions and for all methods of modulation at the edge of the service area. (WRC-97).

5.494 Additional allocation: in Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Central African Rep., the Congo, Côte d'Ivoire, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Madagascar, Mali, Morocco, Mongolia, Nigeria, Qatar, Dem. Rep. of the Congo, Syria, Senegal, Somalia, Sudan, Chad, Togo and Yemen, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-97)

5.495 Additional allocation: in Bosnia and Herzegovina, Croatia, Denmark, France, Greece, Liechtenstein, Monaco, Uganda, Portugal, Romania, Slovenia, Switzerland, Tanzania, Tunisia and Yugoslavia, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-2000)

5.496 Additional allocation: in Austria, Azerbaijan, Kyrgyzstan and Turkmenistan, the band 12.5-12.75 GHz is also allocated to the fixed service and the mobile, except aeronautical mobile, service on a primary basis. However, stations in these services shall not cause harmful interference to fixed-satellite service earth stations of countries in Region 1 other than those listed in this footnote. Coordination of these earth stations is not required with stations of the fixed and mobile services of the countries listed in this footnote. The power flux-density limit at the Earth's surface given in Table **21-4** of Article **21**, for the fixed-satellite service shall apply on the territory of the countries listed in this footnote. (WRC-2000)

5.497 The use of the band 13.25-13.4 GHz by the aeronautical radionavigation service is limited to Doppler navigation aids.

5.498 (SUP - WRC-97)

5.498A The Earth exploration-satellite (active) and space research (active) services operating in the band 13.25-13.4 GHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service. (WRC-97)

5.499 Additional allocation: in Bangladesh, India and Pakistan, the band 13.25-14 GHz is also allocated to the fixed service on a primary basis.

5.500 Additional allocation: in Algeria, Angola, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Mali, Malta, Morocco, Mauritania, Nigeria, Pakistan, Qatar, Syria, Senegal, Singapore, Sudan, Chad and Tunisia, the band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-2000)

5.501 Additional allocation: in Austria, Azerbaijan, Hungary, Japan, Mongolia, Kyrgyzstan, Romania, the United Kingdom and Turkmenistan, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis. (WRC-2000)

5.501A The allocation of the band 13.4-13.75 GHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis. (WRC-97)

5.501B In the band 13.4-13.75 GHz, the Earth exploration-satellite (active) and space research (active) services shall not cause harmful interference to, or constrain the use and development of, the radiolocation service. (WRC-97)

5.502 In the band 13.75-14 GHz, an earth station in the fixed-satellite service shall have a minimum antenna diameter of 4.5 m and the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. In addition the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services shall not exceed 59 dBW. The protection of assignments to receiving space stations in the fixed-satellite service operating with earth stations that, individually, have an e.i.r.p. of less than 68 dBW shall not impose constraints on the operation of the radiolocation and radionavigation stations operating in accordance with the Radio Regulations. No. **5.43A** does not apply. See Resolution **733 (WRC-2000**). (WRC-2000).

5.503 In the band 13.75-14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

- the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed 71 dBW in the 6 MHz band from 13.772 to 13.778 GHz;

- the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

Automatic power control may be used to increase the e.i.r.p. density in the 6 MHz band in this frequency range to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. of 71 dBW or 51 dBW, as appropriate, in the 6 MHz band in clear-sky conditions. (WRC-2000)

5.503A Until 1 January 2000, stations in the fixed-satellite service shall not cause harmful interference to non-geostationary space stations in the space research and Earth exploration-satellite services. After that date, these non-geostationary space stations will operate on a secondary basis in relation to the fixed-satellite service. Additionally, when planning earth stations in the fixed-satellite service to be brought into service between 1 January 2000 and 1 January 2001, in order to accommodate the needs of spaceborne precipitation radars operating in the band 13.793-13.805 GHz, advantage should be taken of the consultation process and the information given in Recommendation ITU-R SA.1071.

5.504 The use of the band 14-14.3 GHz by the radionavigation service shall be such as to provide sufficient protection to space stations of the fixed-satellite service.

5.505 Additional allocation: in Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Botswana, Brunei Darussalam, Cameroon, China, Congo, Korea (Rep. of), Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lesotho, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, Pakistan, the Philippines, Qatar, Syria, the Dem. People's Rep. Of Korea, Senegal, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-2000)

5.506 The band 14-14.5 GHz may be used, within the fixed-satellite service (Earth-to-space), for feeder links for the broadcasting-satellite service, subject to coordination with other networks in the fixed-satellite service. Such use of feeder links is reserved for countries outside Europe.

5.507 Not used.

5.508 Additional allocation: in Germany, Bosnia and Herzegovina, France, Greece, Ireland, Iceland, Italy, The Former Yugoslav Republic of Macedonia, Libya, Liechtenstein, Portugal, the United Kingdom, Slovenia, Switzerland and Yugoslavia, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-2000)

5.509 Additional allocation: in Japan the band 14.25-14.3 GHz is also allocated to the mobile, except aeronautical mobile, service on a primary basis. (WRC-2000)

5.510 The use of the band 14.5-14.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. This use is reserved for countries outside Europe.

5.511 Additional allocation: in Saudi Arabia, Bahrain, Bosnia and Herzegovina, Cameroon, Egypt, the United Arab Emirates, Guinea, Iran (Islamic Republic of), Iraq, Israel, Kuwait, Lebanon, Libya, Pakistan, Qatar, Syria, Slovenia, Somalia and Yugoslavia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-97)

5.511A The band 15.43-15.63 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. Use of the band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth and Earth-to-space) is limited to feeder links of non-geostationary systems in the mobile-satellite service, subject to coordination under No. **9.11A**. The use of the frequency band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth) is limited to feeder links of non-geostationary systems in the mobile-satellite service for which advance publication information has been received by the Bureau prior to 2 June 2000. In the space-to-Earth direction, the minimum earth station elevation angle above and gain towards the local horizontal plane and the minimum coordination distances to protect an earth station from harmful interference shall be in accordance with Recommendation ITU-R S.1341. In order to protect the radio astronomy service in the band 15.35-15.4 GHz, the aggregate power flux-density radiated in the 15.35-15.4 GHz band by all the space stations within any feeder-link of a non-geostationary system in the mobile-satellite service (space-to-Earth) operating in the 15.43-15.63 GHz band shall not exceed the level of –156 dB(W/m^2) in a 50 MHz bandwidth, into any radio astronomy observatory site for more than 2% of the time. (WRC-2000)

5.511B (SUP - WRC-97)

5.511C Stations operating in the aeronautical radionavigation service shall limit the effective e.i.r.p. in accordance with Recommendation ITU-R S.1340. The minimum coordination distance required to protect the aeronautical radionavigation stations (No. **4.10** applies) from harmful interference from feeder-link earth stations and the maximum e.i.r.p. transmitted towards the local horizontal plane by a feeder-link earth station shall be in accordance with Recommendation ITU-R S.1340. (WRC-97)

5.511D Fixed-satellite service systems for which complete information for advance publication has been received by the Bureau by 21 November 1997 may operate in the bands 15.4-15.43 GHz and 15.63-15.7 GHz in the space-to-Earth direction and 15.63-15.65 GHz in the Earth-to-space direction. In the bands 15.4-15.43 GHz and 15.65-15.7 GHz, emissions from a non-geostationary space station shall not exceed

the power flux-density limits at the Earth's surface of –146 dB(W/(m^2 .MHz)) for any angle of arrival. In the band 15.63-15.65 GHz, where an administration plans emissions from a non-geostationary space station that exceed –146 dB(W/(m^2 .MHz)) for any angle of arrival, it shall coordinate under No. **9.11A** with the affected administrations. Stations in the fixed-satellite service operating in the band 15.63-15.65 GHz in the Earth-to-space direction shall not cause harmful interference to stations in the aeronautical radionavigation service (No. **4.10** applies). (WRC-97).

5.512 Additional allocation: in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Cameroon, the Congo, Costa Rica, Egypt, El Salvador, the United Arab Emirates, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), Jordan, Kuwait, Libya, Malaysia, Morocco, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Singapore, Slovenia, Somalia, Sudan, Swaziland, Tanzania, Chad, Yemen and Yugoslavia, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-97)

5.513 Additional allocation: in Israel, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. These services shall not claim protection from or cause harmful interference to services operating in accordance with the Table in countries other than those included in No. **5.512**.

5.513A Spaceborne active sensors operating in the band 17.2-17.3 GHz shall not cause harmful interference to, or constrain the development of, the radiolocation and other services allocated on a primary basis. (WRC-97)

5.514 Additional allocation: in Algeria, Germany, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Cameroon, Costa Rica, El Salvador, the United Arab Emirates, Finland, Guatemala, Honduras, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Libya, Nepal, Nicaragua, Oman, Pakistan, Qatar, Slovenia, Sudan and Yugoslavia, the band 17.3-17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. **21.3** and **21.5** shall apply. (WRC-2000)

5.515 In the band 17.3-17.8 GHz, sharing between the fixed-satellite service (Earth-to-space) and the broad-casting-satellite service shall also be in accordance with the provisions of § 1 of Annex 4 of Appendix **30A**.

5.516 The use of the band 17.3-18.1 GHz by geostationary-satellite systems in the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. The use of the band 17.3-17.8 GHz in Region 2 by systems in the fixed-satellite service (Earth-to-space) is limited to geostationary satellites. For the use of the band 17.3-17.8 GHz in Region 2 by feeder links for the broadcasting-satellite service in the band 12.2-12.7 GHz, see Article **11**. The use of the bands 17.3-18.1 GHz (Earth-to-space) in Regions 1 and 3 and 17.8-18.1 GHz (Earth-to-space) in Region 2 by non-geostationary-satellite systems in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000)

5.517 In Region 2, the allocation to the broadcasting-satellite service in the band 17.3-17.8 GHz shall come into effect on 1 April 2007. After that date, use of the fixed-satellite (space-to-Earth) service in the band 17.7-17.8 GHz shall not claim protection from and shall not cause harmful interference to operating systems in the broadcasting-satellite service.

5.518 Different category of service: in Region 2, the allocation of the band 17.7-17.8 GHz to the mobile service is on a primary basis until 31 March 2007.

5.519 Additional allocation: the band 18.1-18.3 GHz is also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis. Its use is limited to geostationary satellites and shall be in accordance with the provisions of Article **21**, Table **21-4**.

5.520 The use of the band 18.1-18.4 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links of geostationary-satellite systems in the broadcasting-satellite service. (WRC-2000)

5.521 Alternative allocation: in Germany, Denmark, the United Arab Emirates, Greece and Slovakia, the band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. **5.33**). The provisions of No. **5.519** also apply. (WRC-2000).

5.522 (SUP - WRC-2000)

5.522A The emissions of the fixed service and the fixed-satellite service in the band 18.6-18.8 GHz are limited to the values given in Nos. **21.5A** and **21.16.2**, respectively. (WRC-2000)

5.522B The use of the band 18.6-18.8 GHz by the fixed-satellite service is limited to geostationary systems and systems with an orbit of apogee greater than 20 000 km. (WRC-2000)

5.522C In the band 18.6-18.8 GHz, in Algeria, Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, Jordan, Lebanon, Libya, Morocco, Oman, Qatar, Syria, Tunisia and Yemen, fixed-service systems in operation at the date of entry into force of the Final Acts of WRC-2000 are not subject to the limits of No. **21.5A**. (WRC-2000)

5.523 (SUP - WRC-2000)

5.523A The use of the bands 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **9.11A** and No. **22.2** does not apply. Administrations having geostationary-satellite networks under coordination prior to 18 November 1995 shall cooperate to the maximum extent possible to coordinate pursuant to No. **9.11A** with non-geostationary-satellite networks for which notification information has been received by the Bureau prior to that date, with a view to reaching results acceptable to all the parties concerned. Non-geostationary-satellite networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete Appendix **4** notification information is considered as having been received by the Bureau prior to 18 November 1995. (WRC-97)

5.523B The use of the band 19.3-19.6 GHz (Earth-to-space) by the fixed-satellite service is limited to feeder links for non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. **9.11A**, and No. **22.2** does not apply.

5.523C No. **22.2** shall continue to apply in the bands 19.3-19.6 GHz and 29.1-29.4 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **4** coordination information, or notification information, is considered as having been received by the Bureau prior to 18 November 1995. (WRC-97)

5.523D The use of the band 19.3-19.7 GHz (space-to-Earth) by geostationary fixed-satellite service systems and by feeder links for non-geostationary-satellite systems in the mobile-satellite service is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**. The use of this band for other non-geostationary fixed-satellite service systems, or for the cases indicated in Nos. **5.523C** and **5.523E**, is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2**. (WRC-97)

5.523E No. **22.2** shall continue to apply in the bands 19.6-19.7 GHz and 29.4-29.5 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **4** coordination information, or notification information, is considered as having been received by the Bureau by 21 November 1997. (WRC-97)

5.524 Additional allocation: in Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, the Congo, Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon,

Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Dem. Rep. of the Congo, Syria, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Tanzania, Chad, Togo and Tunisia, the band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band. (WRC-2000)

5.525 In order to facilitate interregional coordination between networks in the mobile-satellite and fixed-satellite services, carriers in the mobile-satellite service that are most susceptible to interference shall, to the extent practicable, be located in the higher parts of the bands 19.7-20.2 GHz and 29.5-30 GHz.

5.526 In the bands 19.7-20.2 GHz and 29.5-30 GHz in Region 2, and in the bands 20.1-20.2 GHz and 29.9-30 GHz in Regions 1 and 3, networks which are both in the fixed-satellite service and in the mobile-satellite service may include links between earth stations at specified or unspecified points or while in motion, through one or more satellites for point-to-point and point-to-multipoint communications.

5.527 In the bands 19.7-20.2 GHz and 29.5-30 GHz, the provisions of No. **4.10** do not apply with respect to the mobile-satellite service.

5.528 The allocation to the mobile-satellite service is intended for use by networks which use narrow spot-beam antennas and other advanced technology at the space stations. Administrations operating systems in the mobile-satellite service in the band 19.7-20.1 GHz in Region 2 and in the band 20.1-20.2 GHz shall take all practicable steps to ensure the continued availability of these bands for administrations operating fixed and mobile systems in accordance with the provisions of No. **5.524**.

5.529 The use of the bands 19.7-20.1 GHz and 29.5-29.9 GHz by the mobile-satellite service in Region 2 is limited to satellite networks which are both in the fixed-satellite service and in the mobile-satellite service as described in No. **5.526**.

5.530 In Regions 1 and 3, the allocation to the broadcasting-satellite service in the band 21.4-22 GHz shall come into effect on 1 April 2007. The use of this band by the broadcasting-satellite service after that date and on an interim basis prior to that date is subject to the provisions of Resolution **525 (WARC-92**).

5.531 Additional allocation: in Japan, the band 21.4-22 GHz is also allocated to the broadcasting service on a primary basis.

5.532 The use of the band 22.21-22.5 GHz by the Earth exploration-satellite (passive) and space research (passive) services shall not impose constraints upon the fixed and mobile, except aeronautical mobile, services.

5.533 The inter-satellite service shall not claim protection from harmful interference from airport surface detection equipment stations of the radionavigation service.

5.534 Additional allocation: in Japan, the band 24.65-25.25 GHz is also allocated to the radionavigation service on a primary basis until 2008.

5.535 In the band 24.75-25.25 GHz, feeder links to stations of the broadcasting-satellite service shall have priority over other uses in the fixed-satellite service (Earth-to-space). Such other uses shall protect and shall not claim protection from existing and future operating feeder-link networks to such broadcasting satellite stations.

5.535A The use of the band 29.1-29.5 GHz (Earth-to-space) by the fixed-satellite service is limited to geostationary-satellite systems and feeder links to non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**, except as indicated in Nos. **5.523C** and **5.523E** where such use is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2**. (WRC-97)

5.536 Use of the 25.25-27.5 GHz band by the inter-satellite service is limited to space research and Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space.

5.536A Administrations installing Earth exploration-satellite service earth stations cannot claim protection from stations in the fixed and mobile services operated by neighbouring administrations. In addition, earth stations operating in the Earth exploration-satellite service should take into account Recommendation ITU-R SA.1278. (WRC-2000)

5.536B In Germany, Saudi Arabia, Austria, Belgium, Brazil, Bulgaria, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Liechtenstein, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, Syria, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Sweden, Switzerland, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-97)

5.537 Space services using non-geostationary satellites operating in the inter-satellite service in the band 27-27.5 GHz are exempt from the provisions of No. **22.2**.

5.537A In Bhutan, Indonesia, Iran (Islamic Republic of), Japan, Maldives, Mongolia, Myanmar, Pakistan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.5-28.35 GHz may also be used by high altitude platform stations (HAPS). The use of the band 27.5-28.35 GHz by HAPS is limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. (WRC-2000)

5.538 Additional allocation: the bands 27.500-27.501 GHz and 29.999-30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up-link power control. Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of 10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. In the band 27.500-27.501 GHz, such space-to-Earth transmissions shall not produce a power flux-density in excess of the values specified in Article **21**, Table **21-4** on the Earth's surface.

5.539 The band 27.5-30 GHz may be used by the fixed-satellite service (Earth-to-space) for the provision of feeder links for the broadcasting-satellite service.

5.540 Additional allocation: the band 27.501-29.999 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis for beacon transmissions intended for up-link power control.
5.541 In the band 28.5-30 GHz, the earth exploration-satellite service is limited to the transfer of data between stations and not to the primary collection of information by means of active or passive sensors.

5.541A Feeder links of non-geostationary networks in the mobile-satellite service and geostationary networks in the fixed-satellite service operating in the band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks. These methods shall apply to networks for which Appendix **4** coordination information is considered as having been received by the Bureau after 17 May 1996 and until they are changed by a future competent world radiocommunication conference. Administrations submitting Appendix **4** information for coordination before this date are encouraged to utilize these techniques to the extent practicable. (WRC-2000)

5.542 Additional allocation: in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Pakistan, the Philippines, Qatar, Syria, the Dem. People's Rep. of Korea, Somalia, Sudan, Sri Lanka and Chad, the band 29.5-31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. **21.3** and **21.5** shall apply. (WRC-2000).

5.543 The band 29.95-30 GHz may be used for space-to-space links in the Earth exploration-satellite service for telemetry, tracking, and control purposes, on a secondary basis.

5.543A In Bhutan, Indonesia, Iran (Islamic Republic of), Japan, Maldives, Mongolia, Myanmar, Pakistan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services, taking into account No. **5.545**. The use of HAPS in the band 31-31.3 GHz shall not cause harmful interference to the passive services having a primary allocation in the band 31.3-31.8 GHz, taking into account the interference criteria given in Recommendations ITU-R SA.1029 and ITU-R RA.769. The administrations of the countries listed above are urged to limit the deployment of HAPS in the band 31-31.3 GHz to the lower half of this band (31-31.15 GHz) until WRC-03. (WRC-2000)

5.544 In the band 31-31.3 GHz the power flux-density limits specified in Article **21**, Table **21-4** shall apply to the space research service.

5.545 Different category of service: in Armenia, Azerbaijan, Belarus, Georgia, Mongolia, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-2000)

5.546 Different category of service: in Saudi Arabia, Armenia, Azerbaijan, Belarus, Egypt, the United Arab Emirates, Spain, Estonia, Finland, Georgia, Hungary, Iran (Islamic Republic of), Israel, Jordan, Latvia, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, Syria, Kyrgyzstan, Romania, the United Kingdom, the Russian Federation, Tajikistan, Turkmenistan, Turkey and Ukraine, the allocation of the band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**). (WRC-2000)

5.547 The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolutions **75 (WRC-2000)** and **79 (WRC-2000**)). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5-40 GHz and 40.5-42 GHz, administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate (see Resolution **84 (WRC-2000**)). (WRC-2000)

5.547A Administrations should take practical measures to minimize the potential interference between stations in the fixed service and airborne stations in the radionavigation service in the 31.8-33.4 GHz band, taking into account the operational needs of the airborne radar systems. (WRC-2000)

5.547B Alternative allocation: in the United States, the band 31.8-32 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis. (WRC-97)

5.547C Alternative allocation: in the United States, the band 32-32.3 GHz is allocated to the inter-satellite, radionavigation and space research (deep space) (space-to-Earth) services on a primary basis. (WRC-97)

5.547D Alternative allocation: in the United States, the band 32.3-33 GHz is allocated to the inter-satellite and radionavigation services on a primary basis. (WRC-97)

5.547E Alternative allocation: in the United States, the band 33-33.4 GHz is allocated to the radionavigation service on a primary basis. (WRC-97)

5.548 In designing systems for the inter-satellite and radionavigation services in the band 32-33 GHz, and for the space research service (deep space) in the band 31.8-32.3 GHz, administrations shall take all necessary measures to prevent harmful interference between these services, bearing in mind the safety aspects of the radionavigation service (see Recommendation **707**).

5.549 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates,

Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mali, Malta, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, Dem. Rep. of the Congo, Syria, Senegal, Singapore, Somalia, Sudan, Sri Lanka, Togo, Tunisia and Yemen, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-97).

5.550 Different category of service: in Armenia, Azerbaijan, Belarus, Georgia, Mongolia, Uzbekistan, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 34.7-35.2 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-2000)

5.551 (SUP - WRC-97)

5.551A In the band 35.5-36.0 GHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the meteorological aids service and other services allocated on a primary basis. (WRC-97)

5.551AA In the bands 37.5-40 GHz and 42-42.5 GHz, non-geostationary-satellite systems in the fixed-satellite service should employ power control or other methods of downlink fade compensation of the order of 10 dB, such that the satellite transmissions are at power levels required to meet the desired link performance while reducing the level of interference to the fixed service. The use of downlink fade compensation methods are under study by the ITU-R (see Resolution **84 (WRC-2000**)). (WRC-2000).

5.551B (SUP - WRC-2000)

5.551C (SUP - WRC-2000)

5.551D (SUP - WRC-2000)

5.551E (SUP - WRC-2000)

5.551F Different category of service: in Japan, the allocation of the band 41.5-42.5 GHz to the mobile service is on a primary basis (see No. **5.33**). (WRC-97)

5.551G In order to protect the radio astronomy service in the band 42.5-43.5 GHz, the aggregate power flux-density in the 42.5-43.5 GHz band produced by all the space stations in any non-geostationary-satellite system in the fixed-satellite service (space-to-Earth) or in the broadcasting-satellite service (space-to-Earth) system operating in the 41.5-42.5 GHz band shall not exceed –167 dB(W/m 2) in any 1 MHz band at the site of a radio astronomy station for more that 2% of the time. The power flux-density in the band 42.5-43.5 GHz produced by any geostationary station in the fixed-satellite service (space-to-Earth) or in the broadcasting-satellite service (space-to-Earth) operating in the band 42-42.5 GHz shall not exceed –167 dB(W/m 2) in any 1 MHz band at the site of a radio astronomy station. These limits are provisional and will be reviewed in accordance with Resolution **128 (Rev.WRC-2000**). (WRC-2000)

5.552 The allocation of the spectrum for the fixed-satellite service in the bands 42.5-43.5 GHz and 47.2-50.2 GHz for Earth-to-space transmission is greater than that in the band 37.5-39.5 GHz for space-to-Earth transmission in order to accommodate feeder links to broadcasting satellites. Administrations are urged to take all practicable steps to reserve the band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service operating in the band 40.5-42.5 GHz.

5.552A The allocation to the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz is subject to the provisions of Resolution **122 (WRC-97)**[*]. (WRC-97)

5.553 In the bands 43.5-47 GHz and 66-71 GHz, stations in the land mobile service may be operated subject to not causing harmful interference to the space radiocommunication services to which these bands are allocated (see No. **5.43**). (WRC-2000)

[*] *Note by the Secretariat:* This Resolution was revised by WRC-2000.

5.554 In the bands 43.5-47 GHz, 66-71 GHz, 95-100 GHz, 123-130 GHz, 191.8-200 GHz and 252-265 GHz, satellite links connecting land stations at specified fixed points are also authorized when used in conjunction with the mobile-satellite service or the radionavigation-satellite service. (WRC-2000)

5.555 Additional allocation: the band 48.94-49.04 GHz is also allocated to the radio astronomy service on a primary basis. (WRC-2000)

5.555A The band 50.2-50.4 GHz is also allocated, on a primary basis, to the fixed and mobile services until 1 July 2000. (WRC-97)

5.556 In the bands 51.4-54.25 GHz, 58.2-59 GHz and 64-65 GHz, radio astronomy observations may be carried out under national arrangements. (WRC-2000)

5.556A Use of the bands 54.25-56.9 GHz, 57-58.2 GHz and 59-59.3 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density at all altitudes from 0 km to 1 000 km above the Earth's surface produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, shall not exceed 147 dB(W/(m^2.100 MHz)) for all angles of arrival. (WRC-97)

5.556B Additional allocation: in Japan, the band 54.25-55.78 GHz is also allocated to the mobile service on a primary basis for low-density use. (WRC-97).

5.557 Additional allocation: in Japan, the band 55.78-58.2 GHz is also allocated to the radiolocation service on a primary basis. (WRC-97)

5.557A In the band 55.78-56.26 GHz, in order to protect stations in the Earth exploration-satellite service (passive), the maximum power density delivered by a transmitter to the antenna of a fixed service station is limited to –26 dB(W/MHz). (WRC-2000)

5.558 In the bands 55.78-58.2 GHz, 59-64 GHz, 66-71 GHz, 122.25-123 GHz, 130-134 GHz, 167-174.8 GHz and 191.8-200 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **5.43**). (WRC-2000)

5.558A Use of the band 56.9-57 GHz by inter-satellite systems is limited to links between satellites in geostationary-satellite orbit and to transmissions from non-geostationary satellites in high-Earth orbit to those in low-Earth orbit. For links between satellites in the geostationary-satellite orbit, the single entry power flux-density at all altitudes from 0 km to 1 000 km above the Earth's surface, for all conditions and for all methods of modulation, shall not exceed –147 dB(W/(m^2.100 MHz)) for all angles of arrival. (WRC-97)

5.559 In the band 59-64 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **5.43**). (WRC-2000).

5.559A The band 75.5-76 GHz is also allocated to the amateur and amateur-satellite services on a primary basis until the year 2006. (WRC-2000)

5.560 In the band 78-79 GHz radars located on space stations may be operated on a primary basis in the Earth exploration-satellite service and in the space research service.

5.561 In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service. (WRC-2000).

5.561A The 81-81.5 GHz band is also allocated to the amateur and amateur-satellite services on a secondary basis. (WRC-2000)

5.561B In Japan, use of the band 84-86 GHz, by the fixed-satellite service (Earth-to-space) is limited to feeder links in the broadcasting-satellite service using the geostationary-satellite orbit. (WRC-2000).

5.562 The use of the band 94-94.1 GHz by the Earth exploration-satellite (active) and space research (active) services is limited to spaceborne cloud radars. (WRC-97)

5.562A In the bands 94-94.1 GHz and 130-134 GHz, transmissions from space stations of the Earth exploration-satellite service (active) that are directed into the main beam of a radio astronomy antenna have the potential to damage some radio astronomy receivers. Space agencies operating the transmitters and the radio astronomy stations concerned should mutually plan their operations so as to avoid such occurrences to the maximum extent possible. (WRC-2000)